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Absent Friends

ON May 6, we made reference to the then forthcoming General Managers' Conference at Johannesburg, arranged to coincide with the centenary celebrations of the South African Railways and to be attended by General Managers of the railways of Central and Southern Africa and by guests from the United Kingdom, France, Germany, and the Netherlands. We now learn from several of those who attended the conference that the United Kingdom in fact was not represented, although the Chairman of the British Transport Commission was offered, and apparently originally accepted but later cancelled, an invitation from the General Manager of the South African Railways. We understand that the absence of a representative of British Railways gave rise to considerable disappointment, not the less because the South African system was almost entirely developed in its early days by English and Scottish railwaymen. Obviously there was no political import in the lack of representation, for the conference was international in scope, and in any event the British Transport Commission would not adopt a line opposing that of

Mr. Harold Macmillan, the Prime Minister, who has done his best to avoid discord with the South African Government. Nevertheless, it was strongly felt that if the Dutch, German, and French railways could spare high-ranking officers for a fortnight or so—Eng. J. Lohmann, President of the Netherlands Railways, Professor Dr. H. M. Oeftering, President of the German Federal Railway, and Mr. F. Hebert, Assistant General Manager of the French National Railways were present—the same interest might reasonably be expected from Britain. It was realised that the Chairman of the British Transport Commission was heavily committed by the demands of the modernisation plan and by the implementation of the Guillebaud report, but it was thought that a deputy should have been sent. The matter was viewed with some gravity by the British in Africa, who feared an adverse repercussion on British trade. Three points receiving special attention at the conference were standardisation of equipment, the interchange of information, and inter-railway goodwill. Through non-participation, the British Transport Commission has contributed nothing toward achievement of the first two aims and may have damaged the third.

Changes in the Rhodesia Railways Board

CHANGES are announced in the composition of the Rhodesia Railways Board. The new Chairman is Mr. T. H. Grey, who has been Vice-Chairman since 1955, and now assumes the chairmanship on the retirement of Sir Andrew Strachan. He acted as Chairman for 15 months after the retirement of Sir Arthur Griffin until the appointment of Sir Andrew Strachan. Mr. W. T. Masterton, a civil servant from Northern Rhodesia, has been appointed Executive Vice-Chairman. Members of the Board are Mr. J. G. Haskins, Mr. A. D. McLean, Lt.-Col. H. B. Everard, who was General Manager of Rhodesia Railways in 1952-57, and Mr. L. S. Davies. One of the main problems faced by the railway, in common with many other administrations in Africa, is growing road competition. An example of the enlightened attitude, in this matter, of the Rhodesia Railways Board, is the agreement recently concluded with road transport operators, affording co-ordination of road and rail facilities. Along routes where rail and road compete, long-distance road hauliers will not undercut the railway rates for comparable traffic. If the economy of the Federation continues to expand, the outlook for Rhodesia Railways is promising.

Large S.A.R. Surplus in 1959-60

Mr. B. J. Schoeman, the South African Minister of Transport, told the annual general meeting of the Federal Consultative Council in Johannesburg recently that the South African Railways had converted its record deficit of £8,500,000 last year to a surplus of £7,000,000 this year. Giving some of the details, he said that more than 17,000 posts had been abolished by not filling vacancies as they occurred and a considerable saving brought about in this way. In addition overtime had been reduced from £12,000,000 last year to £9,000,000 this year. The main reduction in expenditure had resulted from improved facilities on which some millions of pounds had been spent in recent years. Savings had been effected by electrification and the use of diesel locomotives, by the new marshalling yards, modern train control methods, and mechanised accounting. There had also been a substantial saving on permanent way material, electric power, and other charges. Mr. Schoeman said that these were all permanent savings and had been brought about quite apart from the efficiency and economy campaigns in which the staff had taken part.

Higher Charges in Northern Ireland

RAIL and road passenger and freight charges of the Ulster Transport Authority are to be increased next Monday. Rates for merchandise and charges for season tickets will be increased by about 7½ per cent, and ordinary train and bus fares will carry fixed additions, varying from ¼d. on charges of 5d. and under to 6d. on those above 15s. The season ticket holder, therefore, and the trader are the most affected. The increases, states the U.T.A., are inevitable, after the recent rises in costs, particularly in wages. The Authority has not been accorded the period of stability in labour and material

costs which would have helped it to obtain financial equilibrium, for settlement of current claims by the trade unions, with other costs which have arisen in recent months, will involve additional annual expenditure of some £500,000. Passenger fares were last increased in August, 1957, and freight rates in September, 1958, and, although there have been other substantial increases in costs which have had to be met in the meantime, the U.T.A. has been able in a large measure to offset the increases by internal economies.

Minister's Confidence in C.I.E. Policy

MR. E. CHILDERS, the Irish Minister for Transport & Power, stated in the Dail recently that he was confident that the policy which the Board of Coras Iompair Eireann was pursuing would lead to a realisation of the objective of the 1958 Transport Act, a self-supporting public transport system free from the demoralising effects of subsidisation by the State. Mr. Childers was moving an estimate of £2,431,670 to complete the £3,646,670 required for the Department of Transport & Power. The provision for C.I.E. in the estimates consists of the statutory grant-in-aid of £1,175,000 and a sum of £175,000 in respect of the recoupment to C.I.E. of the cost of redundancy compensation payable by them in the current financial year. The year ended March 31 last was the first year of the five-year reorganisation period, at the end of which C.I.E. is required to be self-supporting. Mr. Childers said that the task confronting the board was formidable, but the enthusiasm and vigour with which they were applying themselves to it was most heartening, and they were pursuing an aggressive sales campaign in their drive to secure more business. The amount of additional freight business already obtained through package deals amounts to more than £250,000 a year.

Stone-Platt-Schindler Co-operation

SIR KENNETH PRESTON, Chairman of Stone-Platt Industries Limited, who is a member of the Southern Area Board of British Railways, is to be the President of a new company, Platt-Schindler Lifts Limited, backed by Stone-Platt and Schindler & Co. Ltd. of Lucerne, Switzerland. The Stone-Platt company is well-known for its manufacture of textile machinery, marine and railway engineering, castings and foundry equipment, as well as air-conditioning and refrigeration plant, electronic instruments, and so forth. For many years it has had business associations with the Schindler company, which, apart from its high reputation in the manufacture of vertical transportation equipment, produces electric motors and generators, and electronic controls. The new company is a further diversification in the Stone-Platt development. The company will undertake in England the manufacture of Schindler design lift and escalator equipment. The development is of interest in the light of the overall modernisation plan of British Railways, which involves the rebuilding of a number of main-line stations, as well as of some of the largest hotels.

Higher Revenue in Malaya

THE improvement in the passenger and goods revenue of the Malayan Railway, which began to show itself during the last quarter of 1959, has continued; but, as the result of a changed rating policy, without which the railway might never have retained much of the traffic it carried during the boom years, more work is being done for less return per unit. Passenger traffic has improved slightly, and although there has been a drop in the number of second class passengers there has been a distinct increase in third class revenue, indicating that the increased comfort of the newest third class coaches is encouraging passengers to travel third class, to the detriment of second class revenue. The increase in goods revenue in respect of most commodities has continued. The financial results for 1959 show a deficit of approximately \$271,000 on the year's working. The result was better than was expected at the beginning of the year, but it was achieved with the assistance on a moratorium of \$1,750,000 in respect of loan interest and redemption charges, otherwise the deficit would have been about \$2,000,000.

More Railway Work for Consulting Engineers ?

WORK for British consulting engineers did not increase in the year ended April 30, 1960, as much as had been hoped, despite the improved economic situation, according to the report of the Council of the Association of Consulting Engineers. The several Regional headquarters of British Railways, it is stated, employed some firms on individual works, including reports on one or two large reconstruction projects, but there was no general application from the British Transport Commission for assistance from the Association in connection with the modernisation programme, though discussions took place on this some three years ago. The report suggests that "it may be that the Commission's plans are not in a sufficiently advanced state for such a request to be made, or that the reappraisal of the programme has modified the demands." The Government, it points out, is constantly pressing the Association to obtain more large works abroad, "but if firms are to be in a position to do this they must be employed on the type of large works which nationalised industries have to carry out at home so that they can continue to obtain the necessary experience. Foreign clients will not be ready to employ consultants on specific jobs unless the consultants can show that they have considerable experience in that type of work."

Inverness-Aberdeen Fast Diesel Service

TWO runs each way daily between Inverness and Aberdeen, Scottish Region, British Railways, in 2½ hr. are to be made by "inter-city" diesel multiple-unit trains introduced as an experimental measure on July 1; the service will continue until the end of the summer timetable. The fastest present timings are 3 hr. 32 min. eastbound and 3 hr. 18 min. westbound, over the 108 miles *via* Mulben. Details are given elsewhere in this issue. The new trains will call at Nairn, Forres, Elgin, and Keith Junction, and offer additional excursion facilities for holidaymakers in an area of great natural beauty and historical interest. Cheap day fares will be available by the diesel services daily and should stimulate tourist traffic. Light refreshments will be served from a "mini-buffet." The object of the experiment is to test the demand for a fast service. The curtailment of journey times, which will benefit intermediate points, should secure for the railway much business and other traffic which otherwise might go by road.

Greater Independence for German Federal Railway

GERMAN railways have always suffered from Government restrictions on passenger and goods charges, and to a greater extent, perhaps, than railways in most other highly-developed countries. A greater measure of independence for the German Federal Railway is reported to have been decided by the Government of Western Germany. Alterations in rates and fares, it is stated, may be made without prior Government approval, provided that no matter of principle is involved. What this amounts to is not clear. Before unification after the war of 1914-18, the various State railways were subject to meticulous limitations in the matter, for instance, of passenger fares, and all manner of fare concessions were compulsory. This continued between the wars. After 1945 some of the Allied occupation authorities attempted without much success, because of political pressures, to procure greater economic freedom for what is now the Federal Railway. It will be interesting to see how far this has now been achieved. Another important decision reported from Bonn is the waiving by the Government of claims totalling D.M.2,200 million against the Federal Railway, or an annual saving of D.M.92 million in repayments and interest.

New Route between Germany and Denmark

THE steamer service between Grossenbrode, in Schleswig-Holstein, Western Germany, and Gedser, in Denmark, has been developed because Warnemünde, the German terminus of the train ferry to and from Gedser, fell to Eastern Germany when the boundary was drawn after the last war. The sea crossing between Grossenbrode and Gedser takes some 3 hr. A shorter rail-and-sea route between the German Federal Republic and Denmark is now being created. A direct rail link is reported to be under construction from near Grossen-

brode over an arm of the Baltic, on causeway and bridges, to the German island of Fehmarn. The line crosses the island to Puttgarden, a packet port under development on the north shore, facing the Danish island of Aaland. From the German port to the Danish harbour of Rødby across the Fehmarn Belt, the crossing by steamer or train ferry could be completed in 1½ hr., though it is stated that Gedser may be retained as the Danish port. Use of this route, which is due to be opened for international traffic in the summer of 1963, will much reduce journey times between Copenhagen and the West.

Good S.R. Public Relations

CONSIDERABLE skill is being shown by the Southern Region, British Railways, in explaining to the public the reasons for some decelerations and probable delays on the Folkestone and Dover main line between Ashford and Dover, during electrification. The June issue of the Region's news sheet *South-East Report*, which is distributed to passengers, shows how slower running and unpunctuality cannot be avoided when major works are in progress on the line. The re-arrangement of tracks and platforms at Shorncliffe and Folkestone Central Stations is outlined in diagrams. Draining and re-ballasting in Sevenoaks Tunnel (to be completed this month) and the way in which it has been delaying trains, are explained. Reference also is made to the multiple-unit trains to run on the Dover via Ashford line in 1962, to the signalling associated with electrification, and to the depot under construction near Hither Green, for perishables arriving from the Continent. All this is recorded clearly, without exaggeration, and with due appreciation of the reader's intelligence, on one sheet. Some other railway managements might follow the Southern Region example.

Light Refreshments on the Caledonian Main Line

A SOLUTION to the problem of catering in trains running over medium distances in which only light refreshments normally are required seems to have been found in the Scottish Region, British Railways. Six trains now include refreshment facilities for the first time, in the form of "mini-buffets." They are the 7.15 a.m. and 1.15 p.m. from Glasgow Buchanan Street to Dundee West, 8.15 a.m. Glasgow Buchanan Street to Aberdeen, 10 a.m. and 4 p.m. Dundee West to Glasgow and 1.30 p.m. Aberdeen to Glasgow, on the main line of the former Caledonian Railway. Each calls at Stirling and Perth. The mini-buffet, with the buffet in the centre of an open second class coach seating 44, is particularly suitable for short- and medium-distance journeys. From Glasgow to Aberdeen is some 153 miles, but much of the traffic is between intermediate points, and it is doubtful whether patronage would justify any more extensive catering facilities. Mini-buffets are economical in staff and afford the opportunity, appreciated by most travellers, of stretching their legs in a walk to the refreshment car.

Automatic Train Control in India

EXPERIMENTS with automatic train control in India, of the contact and inductive types, were carried out on the former Great Indian Peninsula and Bombay, Baroda & Central India Railways some 15 years ago under the direction of an A.T.C. committee whose chairman was Sir George Cuffe. They were the subject of an article in our issue of December 26, 1958. In the Third Five-Year plan for the Indian railways, automatic signalling, operating in conjunction with automatic train control, is planned for the following sections of the Eastern Railway: (a) Howrah to Bandel, (b) Bandel to Naihati, (c) Dum Dum to Naihati, and (d) Asansol to Dhanbad. The type of A.T.C. most suitable for Indian Railways has not yet been decided, but the contact system is not favoured. It seems likely that one of the inductive types will be preferred. The Strowager Hudd and G.R.S. inductive systems gave excellent results during initial tests on the Bombay railways and the subsequent failures when installed on trial sections were in no way occasioned by defects in design or application. The breakdown was caused entirely by repeated pilfering of vital parts from track and engine equipment. This hazard would jeopardize the working of any system selected, and its elimination is a pre-requisite to safe and satisfactory operation.

Luxury Trains

THE term "de-luxe" applied by the British Transport Commission to the new diesel-electric Pullman multiple-unit trains which begin operation shortly in the London Midland and Western Regions of British Railways suggests an over-abundance of rare but desirable qualities which are not necessary for life. While this would be true if applied to the average man, "life" for the business executive, whose travelling needs the new trains are designed primarily to serve, brings particular problems not the least of which is the need for both comfort and safety at much higher rail speeds than have been common in this country hitherto.

The passenger who has no alternative but to devote the maximum time between successive appointments in different cities to either discussion of business matters or the concentrated study of paper work uninterrupted by telephone calls and visitors, or who is responsible for the entertainment of guests, perhaps potential customers from overseas, is deserving of just those special facilities during transit which, until recently, only a sea voyage or a long aeroplane flight could offer. Yet both ships and aircraft are subject to many more unpredictable conditions than those which apply to rail transport. Commercial flying problems have only been solved by the application of intensive scientific research, whereas, for rail travel, the best standards of comfort and convenience achieved early in the century have since been widely accepted in this country as satisfactory and the same empirical basic design formulae appear to have continued in general use until the present day for much of the main-line and some suburban rolling stock currently being placed in service.

With the de-luxe Pullmans, despite advanced suspension design and the extensive use of rubber pivots and mountings, little advantage appears to have been taken of the opportunity to gain improved train performance for given power by strictly enforcing a low weight limitation. This should have received a higher priority in the comprehensive scheme of unconventional design adopted in relation to passenger comfort. Steel remains the predominant material of construction resulting in a six-car train, weighing nearly 300 tons, having a total installed power of only 8 b.h.p. per ton, about 37 per cent less favourable than the heaviest of the air-conditioned first class Trans-Europ Express trains introduced some three years ago. Nevertheless, experience of riding in the diesel-locomotive-hauled but otherwise-conventional British Pullmans of recent years with their swift acceleration and excellent timekeeping can give only a small impression of the degree of luxury achieved by the new de-luxe Pullman trains. The reasons are not far to seek in the illustrated description given elsewhere in this issue.

So successful is the Metro-Schlieran design of helically-sprung frictionless bogie suspension with hydraulic damping, in combination with heavy insulation to bodysides and suspended flooring in passenger compartments, wide air-sealed gangways between cars, and double glazing, that a new conception of the possibilities of railway travel becomes obvious to the passenger during the earliest stages of a journey. In fact there is a most welcome isolation from all fatiguing sensations of unpleasant sound and harsh vibration. Full air-conditioning is used for the first time in Britain, with controlled temperature and humidity. Armchair seats are deeply padded with foam rubber and those in the first class saloons can be adjusted easily to give a reclining position. Table service will include specially selected menus and wine list. A smooth pick-up on starting and stable riding at high speeds are ensured by a new type of permanent coupling which absorbs both buffing and drawing loads.

The ability to stop quickly and safely from speeds of up to 90 m.p.h. is essential. For this reason Westinghouse automatic air brakes have been adopted with special electro-pneumatic two-stage operation and automatic slack adjustment. A characteristic of the conventional cast-iron brake blocks is that their coefficient of friction increases considerably as they reduce the speed of the train. If the limit on braking force, necessary at low speeds to prevent skidding, is effective also at high speeds then the stopping distance is greater than the minimum possible achieved with the two-stage system. The increased brake force can be used when needed most without increasing excessively the general wear-rate of tyres and blocks.

The speed-sensitive change-over feature does not call for attention by the train crew and it is operative for all stages of brake application. The basic e.p. system is similar to that used on many electric trains of British Railways and on the London Underground. It operates simultaneously throughout the train to ensure balanced braking on all cars and is designed for progressive application and release and with the essential fail-to-safe feature universal on vacuum-braked stock.

The system of transmission chosen is that of electrical power conveyed to four motored axles in the second and third bogies from each end of the train formation and with the extreme end bogies sharing the weight of twin 1,000-b.h.p. traction diesel generating sets. This is a development of the arrangement used in the diesel multiple-unit train sets of the Southern Region. Introduction of the de-luxe Pullmans will mean the addition to Western Region rolling stock of diesel-electric traction for the first time other than for shunting duties. Hitherto the Region has adhered strongly and exclusively to hydraulic transmission for its diesel passenger trains.

Progress in Northern India

THE way in which the Northern Railway of India is overcoming many difficulties, some of them inherent in the formation of the system from portions of other broad- and metre-gauge railways, is described by Mr. M. K. Kaul, who retired recently from the position of General Manager of the railway.

At the time of its formation in April, 1952, the Northern Railway had very limited workshop capacity. The former Eastern Punjab Railway, one of its constituents, had no workshop of its own, as the Mughalpura Workshops of the North Western Railway, from which the E.P.R. in turn had been formed, had fallen, on Partition in 1947, to Pakistan. The Allahabad, Moradabad and Lucknow Divisions of the former East Indian Railway depended primarily on Jamalpur and Lillooah shops, those at Lucknow having a subsidiary status, with facilities to deal with only small locomotives. Large-scale expansions, therefore, became an urgent necessity. A plan was drawn up and is now being executed. The requisite capacity should be available during the Third Five-Year Plan period.

Work similarly had to be undertaken for overtaking overdue renewals of track and structures and the strengthening of rails, sleepers, and bridges. Even whilst the management was grappling with these problems, Mr. Kaul explains, traffic on routes, notably on the Allahabad—Kanpur, Moradabad—Saharanpur and Delhi—Rewari sections, outstripped capacity, necessitating urgent execution of works to increase line capacity.

The position in regard to passenger coaches was another matter of concern. To mitigate overcrowding and cater for increasing traffic, additional coaches had to be pressed into service to augment the load of existing trains and enable more trains to be run. Postponement of replacement of over-age passenger coaches became unavoidable. Inadequate workshop capacity, a high percentage of obsolete coaches in service, and the increasing incidence of damage to, and theft of, fittings in coaches, imposed a heavy strain on resources.

Despite these handicaps, increasing emphasis has been laid on the provision of passenger amenities. During the last three years nearly £1,500,000 has been expended on the Northern Railway under this head. Of the 1,153 stations open for passenger traffic 1,123, or 97 per cent, have waiting halls for third class passengers. Covered sheds exist or have been provided on 359 platforms. Similarly, 947 platforms are, or have been, raised above rail-level. More stations are being provided with these basic amenities in a phased programme. Last year, 940 fans were fitted in third class carriages. Very soon, almost all the passenger stock will have been equipped with fans except for vehicles due for replacement, and those which run on branch lines at low speeds; in the latter case storage batteries cannot bear the load of fans at low speeds and frequent stops do not allow the dynamos to take over.

Since its inception the Northern Railway has pressed into service some 364 additional coaches, mostly third class, and introduced new trains. Wherever possible the lie-over time of passenger sets has been curtailed, or their working revised, to afford maximum user.

With the opening of new stations and progressive increase

in the number of stops by most trains, some deceleration would normally be unavoidable; but special care was taken and by speeding-up most trains, many of the losses of time due to additional halts have been more than absorbed.

The other factor which has to be reckoned with these days is the persistent pulling of alarm chains. Every 15 or 20 min., according to Mr. Kaul, some train is detained somewhere on the Indian railways because of the alarm signal. This disease, he states, was comparatively unknown in former years, and its effect was less then as fewer trains were running, so that time lost by one train did not materially affect the running of other trains. The position today is quite different.

Despite the heavy increase in the density of traffic, execution of many civil engineering works, and a great increase in the amount of emergency stops caused by alarm chain pulling, passenger train punctuality, on the whole, is considered satisfactory. Until 1957-58, passenger train punctuality on the broad gauge was consistently above 87 per cent. During 1958-59 it declined to 78.8 per cent. Last year, however, it showed signs of improvement and performance, on analysis, expected to prove to have been well above 85 per cent. On the metre gauge, during the last three years, punctuality has consistently exceeded the 90 per cent mark.

Because of the steep increase in the goods traffic, occasioned by the successive Five-Year Plans, which has developed much faster than the physical resources of the railways, it has become necessary to get more work from locomotives and wagons. Service to traders has been improved by three measures. The first was the introduction of "Quick Transit Service." This aimed at delivery of goods at destination within a guaranteed time, at a very nominal surcharge, the surcharge being refunded should the consignments be delayed beyond the guaranteed period. Introduced four years ago between 12 pairs of important stations, the scheme has been continually expanded and improved till today it embraces about 60 pairs of stations, and traders have shown their appreciation of the plan. The second measure was the opening of an increasing number of out-agencies and city booking agencies. While the former extended the facility of rail transport to areas not directly connected by rail, the latter are useful in big cities, where the growth of population during the last decade has made it necessary to increase the number of points where booking facilities are available, and to locate such points in the heart of population centres or in relatively distant suburbs. The third measure is the introduction of collection and delivery of parcels and goods. This was introduced only a few months back at Kanpur. Since then the facility has been extended to other centres.

The most important factor in increasing the speed of goods trains has been the introduction of what are known on the Northern Railway as "crack specials." Five such trains started running in June, 1958. Their number has grown steadily, and today 42 goods trains are in this category. These trains normally perform the work of two ordinary goods trains, and result in immense operating and staff economies. On sections where capacity was outstripped by traffic, they were the answer to the challenge of carrying mounting traffic. It is also largely because of these trains that goods train speeds on the Northern Railway are higher than ever before. Closer attention to the maintenance of locomotive and wagons has helped to keep a larger number in service. To quote one example, while the average daily number of wagons on line on the Northern Railway increased from 26,862 in 1952-53 to 28,018 in 1957-58, wagons awaiting repairs fell from 2,170 to 1,023.

Improved signalling, heavier track, faster trains, higher-capacity wagons, and other measures which increase carrying capacity are being tried so as to avoid doubling. On the Delhi—Panipat—Ambala section, for instance, the old signalling is being replaced with multiple-aspect upper quadrant signalling to facilitate speedier passage of trains. In the Delhi area, where lineside buildings make doubling and quadrupling impossible, new signalling is reducing the time required for giving line clear and for receiving and starting trains. The space interval between following trains has been drastically reduced.

Additional traffic in food grains is expected as a result of completion of the Rajasthan Canal irrigation project. A coal-field is to be developed at Singareli, near the Rihand Dam. Under the Third Five-Year Plan, many new industrial plants will be inaugurated and existing works augmented, all of which will increase traffic.

Ceylon Government Railway in 1958

MR. B. D. RAMPALA, General Manager, of the Ceylon Government Railway, has sent us a copy of his Administration Report for the year ended December 31, 1958. The accounts and statistics included in the report cover the financial year ended September 30, 1958. Widespread disorganisation of services occurred during 1958, and Mr. Rampala describes the year as probably the worst from an operation point of view in the railway's history. On the heels of disruption caused by strikes and track washaways, a devastation of unprecedented magnitude caused by wind and rain to rail tracks and bridges necessitated suspension of services on over 70 per cent of the system. Then followed a general strike, a go-slow movement by a section of workers, and civil disturbances throughout the country. Train timekeeping was completely thrown out of gear, and even at the time of writing the report (April, 1959) it had not been recovered. The punctuality of trains, which had reached an all-time peak of 76 per cent in 1957 declined to 59 per cent in 1958.

Modernisation progress was hit by these events, and also by delay in delivery of new power coaches and inability to place a contract for installation of colour-light signalling. Despite delays and the abnormal conditions, all-out efforts were made to proceed with the set programme of work as far as possible. In view of the reluctance of reputable firms to undertake installation of colour-light signalling in Ceylon at a reasonable cost, the railway was compelled to undertake the installation work itself, which necessitated the training of railway staff abroad. This further delayed the commencement of work. The proposed improvement of suburban services has not progressed because of difficulties in obtaining delivery of imported equipment and material as anticipated. The purchase of 30 out of 45 four-coach train sets required for suburban services is being financed by the U.S. Government. Two more broad-gauge powerful diesel locomotives were gifted under Colombo Plan Aid by the Canadian Government, bringing the total from that source to 10.

Revenue earned during the financial year decreased by Rs. 8,663,747, with decreases recorded under all heads of revenue except miscellaneous receipts. Working expenses rose Rs. 5,765,641. Train mileage decreased by 10.75 per cent. The working loss was Rs. 29,530,410, supplemented by Rs. 10,175,185 for interest and annuity payments, making a total deficit of Rs. 39,705,595. Salaries, wages and other emoluments of staff, cost of stores and materials and other expenses required for maintaining the service have increased by very nearly 400 per cent since 1940, but, Mr. Rampala points out, there has been no major increase in fares and rates charged to the public. The 3 cents a mile suburban third class passenger fare is about the same as in 1940. A rise of Rs. 6,146,094 to Rs. 55,828,016 in salaries and wages was the major item in the overall rise in working expenses, offset by a decline of Rs. 1,886,776 in fuel and coal costs.

Some of the more important results of the year's working, as compared with 1956-57, are summarised below:

	1956-7 (Thousands)	1957-8 (Thousands)
Passenger journeys	53,836	52,753
Goods ton-mileage	195,265	161,349
Passenger train-miles	5,003	—
Goods train-miles	1,967	—
	(Rs. thousands)	
Passenger receipts	31,488	28,138
Railcar receipts	255	252
Parcel & mail receipts	4,736	3,927
Goods & livestock receipts	41,054	36,233
Total revenue	81,121	72,458
Working expenses	96,222	101,988
Deficit	24,924*	39,705*

* Including Rs. 9,823,000 and Rs. 10,175,185 respectively for interest and annuity payable.

The work of reconstruction after the December, 1957, floods, is still in hand, and will take another two or three years to complete. Route-mileage remained at 898 miles, of which 811 were of 5-ft. 6-in. and 87 (the Kelani Valley) line 2-ft. 6-in. gauge. The 32-mile Bangadeniya-Puttalam section, abandoned during the last war, is to be re-opened for passenger and goods traffic at a cost of Rs. 13,400,000, including relaying and initial costs of rolling stock.

During 1957-58 two M.2B class diesel-electric locomotives (broad gauge) were put into service, one M.3 class diesel-electric shunting locomotive (broad gauge) and one spare power unit and two bogies for M.1 class locomotives (broad gauge). No new carriages went into service. Of the 223 steam

locomotives in commission, 80 (36 per cent) are over 40 years of age and beyond economic repairs, while 94 locomotives (42 per cent) are between 30-40 years of age. There were 45 broad gauge and 9 narrow gauge diesel locomotives and 23 diesel-electric railcars in commission.

Irish Summer Train Services

THE summer timetables of Coras Iompair Eireann contain the usual additional services over the Cork main line, at 8.55 and 11.25 a.m. from Dublin Kingsbridge to Killarney and Tralee, both non-stop over the 144½ miles to Mallow, in 155 and 167 min. respectively. The corresponding return trains leave Tralee at 1.35 and 4.50 p.m., and reach Dublin at 6.40 and 9.15 p.m., the latter non-stop from Mallow, but the former calling also at Thurles and Portlaoise.

Additional expresses run from Dublin at 2 p.m. to Limerick via Nenagh, first stop Ballybrophy, arriving at 4.45 p.m., and by the same route at 11.50 a.m. from Limerick, reaching Dublin at 2.35 p.m. The starting of the additional midday express from Dublin to Waterford via Carlow has been altered from last summer's 12 noon to 1.40 p.m., arriving at 4.30 p.m.; the additional 1.20 p.m. back runs in unaltered times other than a 5 min. later arrival, at 4.15 p.m.

The principal diesel expresses between Dublin and Cork have now received names; the 3 hr. 8.45 a.m. down and 6 p.m. up are called "Slainte," and the 9 a.m. up and 2.25 p.m. down are "Faite." Also the 6.50 p.m. combined diesel train from Westland Row to Galway, which uses the Cork main line as far as Portarlinton, and the Clara branch thence to Athlone, is now "Cu na Mara," with the corresponding morning express in the reverse direction. On the main line to the west, the 2 p.m. from Westland Row to Sligo and the return train at 7.10 p.m. are restored for the summer.

Over the former Great Northern main line the 6.30 p.m. from Dublin Amiens Street to Belfast is restored, with an arrival at 9.35 p.m., replacing the winter 6.25 p.m. to Dundalk only. The 9.15 a.m. and 2.45 p.m. from Dublin are 5 and 12 min. later into Belfast respectively, at 12.20 and 5.52 p.m. In the southbound direction last summer's 12 noon service from Belfast is restored, leaving at 11.40 a.m. and reaching Dublin at 2.45 p.m.; the 2.15 p.m. reverts to its 3 p.m. departure, and is due in Dublin at 6.15 instead of 5.5 p.m. The 8.15 a.m. and 6 p.m. from Belfast both reach Amiens Street 10 min. later, at 11.15 a.m. and 9.15 p.m. respectively.

On the Ulster Transport Authority's principal main line the 11.10 a.m. from Londonderry calls additionally at Antrim without increase of overall journey time, which involves a somewhat ambitious booking of 11 min. for the 11½ miles from Ballymena to Antrim, start to stop. There are no further changes of note.

Operating Efficiency on American Railroads

(By a correspondent)

IN an authoritative review of railroad operations in 1959, Mr. J. Elmer Monroe, Vice-President, Association of American Railroads, states that since 1945 wage rates of railway employees have increased by 174 per cent and prices of materials by 109 per cent. Average revenue per ton mile is up only 51 per cent and per passenger mile 58 per cent. The task of management has been to prevent rising expenses from consuming the profit margin and the wonder is that the railroad industry has been able to survive at all.

The trend of statistics over many years proves that gains in efficiency are hard to obtain when traffic volume ceases to expand. A comparison between 1946 and 1959 results, however, shows remarkable improvements in traffic working. The wagon load increased by 2 tons to 33.3 tons. Measured by ton miles per train mile, the train load rose by nearly a third from 1,086 to 1,443 tons. Yet freight train speed was 22 per cent faster, rising from 16 to 19.5 miles an hr. The quicker movement helped to lift the hourly output of freight train operation from 37,057 gross ton miles by two-thirds to 61,926 gross ton miles in 1959. The weak statistic was the

daily wagon mileage, which declined from 48.2 in 1955 to 45.9 last year, though it was well above the 1958 figure of 43.6.

The general averages quoted above refer to 219,750 miles of road, operated by 109 independent companies. Results for individual railroads differed widely. The Norfolk & Western, operating 2,720 miles, largely in the Virginia and West Virginia coalfields, had a wagon load of 53 tons, a train load of 2,782 tons, and a train speed of 17.6 miles an hr., combining to produce 87,868 gross ton miles in a train hr. The Pennsylvania moved a great variety of traffic at the same speed on 9,860 miles of road, with a wagon load of 34 tons and a train load of 1,502 tons, so that its output of freight train operation was 55,770 gross ton miles an hr. In the far West the Union Pacific hauled trains of 73 wagons with a net load of 1,322 tons, often by gas-turbine locomotives, at a speed of 27.8 m.p.h.; it turned out 88,263 gross ton miles in a train hr., the highest rate of productivity for any major railroad, but that did not avoid a fall in its earnings of nearly 15 per cent.

The Union Pacific is proud of its fast freight trains and also of its passenger express services, run at an average speed of

51.8 m.p.h. Its passenger revenue last year was, however, stationary at \$28 million, a sixteenth part of its freight revenue of \$449 million. Only the Pennsylvania, New York Central, Santa Fe and Southern Pacific earned more freight revenue, but the Santa Fe alone had a small increase in passenger revenue.

Since 1948 the U.S.A. railroads have withdrawn passenger services from 59,700 miles of road and have reduced passenger train miles from 407 million to 225 million, less than the coaching train miles run by British Railways last year.

Mr. Elmer Monroe winds up his survey with a suggestion that freight traffic prospects for 1960 are better, but fears that passenger business may decline further. He adds that much study is being devoted to the railroad passenger problem. As the Interstate Commerce Commission spent three years from 1956 to May, 1959 on an investigation into the nature and causes of the passenger deficit without finding a cure, the chances are that the problem may be solved by the cessation of main-line passenger services, save in exceptional cases, and by making special arrangements with local authorities for commuter services which are essential in the public interest.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Railway Wagon Supply

June 14

SIR,—In today's *Times* an advertisement, "reporting railway progress," stated that "in 1958 British Railways shifted 243 million tons of freight; 18,426 million ton miles were covered by 1,005,500 wagons." This belated announcement reveals that in the middle of June we are without last year's railway results, though we may reckon that our railways then handled about 9,000,000 fewer tons of traffic and worked about 710,000,000 fewer ton miles, decreases of around 3 per cent from 1958.

According to the issues of *Transport Statistics* giving the rolling stock position at intervals each year, the 1958 ton miles were produced by an average stock of 998,564 serviceable vehicles. In 1957 the average number of serviceable freight vehicles was 1,031,820. By 1959 it shrank to 910,238, and traffic was lost through wagon shortages at a time when freight train tonnage was at a lower level than in the year 1933, when the industrial recession between the wars was at its worst. In March, 1960, the number of available freight vehicles was 905,770, a decrease of 4,468, or .5 per cent, from 1959. At the present crisis in railway development, what is wanted is an authoritative statement about the policy now in force for maintaining an adequate supply of wagons to meet demands estimated to arise in the near future.

Yours faithfully,

R. BELL

Clacton-on-Sea, Essex.

Passenger Timetables

June 13

SIR,—You state on page 642 of your June 3 issue that there is insufficient traffic between Britain and the Continent to justify synchronisation of the dates of commencement of the summer and winter passenger timetables of British Railways and of the Continental systems.

May I suggest that that is not really the point, though in fact there is far more passenger traffic between Great Britain and France, Belgium, and Holland than between, say, France and Spain or between Sweden and Norway, Denmark, and Germany? The real point is that, by agreement, the summer passenger timetables of all European main-line railways, including those in such different environments as Finland and Spain, are in force from the last Sunday in May (or the first in June) to the last in September (or the first Sunday in October). For some years British Railways followed this practice, except that our services began on a Monday.

In the review in the same issue of the Scottish Region summer service you suggest that for a passenger excluded from the up *Midday Scot*, in which accommodation is limited, from Glasgow Central, there is no alternative service. If such a passenger cares to console himself with a good lunch, he

can go to Glasgow Queen Street and, leaving 1 hr. 10 min. later, at 2.30 p.m., change at Edinburgh Waverley, and be in Kings Cross at 10.40 p.m., 10 min. later than the *Midday Scot* at Euston.

Yours faithfully,

G. H. HAFTER

49, Church Street, Isleworth, Middlesex

June 17

SIR,—The Southern Region's feat in publishing their summer timetable in March, which Mr. R. K. Kirkland rightly praises in your issue of June 3, has no parallel on the Continent, but Continental railways have a different way of disseminating information in advance. They publish separate advance timetable summaries or proofs, often as early as January, and thus leave the timetable staffs free to make further adjustments to the main book up to the end of April.

Most administrations take these proofs from the standing type of the main book, but the French publish a condensed "Projet du Service Voyageurs" giving main lines and stations only. The type of this book, when corrected, then serves as a condensed national timetable of main-line services, another thing we lack in Britain.

It is, of course, these proofs and "projects" which enable us to include a summer service supplement in the spring issues of *Cooks* timetable.

Yours faithfully,

J. H. PRICE,

Editor,
Cooks Continental Timetable

Berkeley Street, London, W.1

Long-welded Rails

June 14

SIR,—The concise and informative article on long-welded rails, on British Railways in your June 3 issue, stated that investigations had proved that the most suitable type of sleeper for use for long-welded rail was concrete as opposed to timber.

I would like to point out that this statement did not truly relate the facts, in that as Sir Brian Robertson, Chairman of the British Transport Commission, said only last March at Grosvenor House, the last word has probably not yet been said about the use of concrete sleepers to replace timber.

The fact is that for use with long-welded rails, the Western Australian hardwood jarrah sleeper is being used in large quantities under long-welded rails in at least one Region of British Railways, and is providing magnificent track.

Yours faithfully,

R. A. WILSON,

Fellow of the Permanent Way Institution

Pinner Hall, London, E.C.2

THE SCRAP HEAP

"It's Quicker by Rail" Thought the Dog

A golden Labrador, the police decided, would be far better off in a home . . . even though his manners were impeccable. They could not trace his owner. The dog is believed to have boarded an express at Portsmouth. While it was speeding to Waterloo he quietly paced the corridors, a real man's dog in his chain choker—which lacked a name plate. The police took over when he stepped out at Waterloo.—From the "Daily Express."

The Luncheon Stop at York

A correspondent of *The Times* in November, 1900, called attention to "the singular state of things under which railway travellers suffered on the East Coast route to Edinburgh." He stated: "When the 20 min. luncheon stop at York was abolished for the *Flying Scotsman*, on the introduction of dining-cars, the running time was not accelerated by the Great Northern or North British railways. The North Eastern resolved to give the travelling public the benefit of 15 min. of the time saved, and booked the *Flying Scotsman* to arrive in Edinburgh at 6.15 p.m. in place of 6.30. The North British management refuses to countenance the acceleration, and keeps the train standing idle for 15 min. at Berwick Station."

Light-weight Train

Several aluminium railway vehicles have been loaned by the British Transport Commission for showing at the international exhibition of aluminium in railway rolling stock now being held in Strasbourg. All the vehicles were marshalled into a train and crossed to the Continent on the Dover-Dunkirk train ferry on June 11. The aluminium stock consisted on a London Transport Executive District Line car, a British Railways box wagon loaded with aluminium com-

ponents, a Derby-built two-car diesel unit, a 16-ton mineral wagon, a 21-ton hopper-wagon, and an experimental aluminium container on a British Railways flat wagon. The exhibition remains open until Sunday.

Centenary of Berne Station

On May 1 the main station of the Swiss Federal Railways in Berne celebrated its centenary. The original station was a terminal; trains from the Zurich and Basle directions ran direct into it, but those of Geneva and Lausanne had to run past it and reverse into it. Thirty years later, between the years 1889 and 1891, it was rebuilt as a through station; the original terminus building still exists, in part as a hall for the sorting of baggage and parcels.

In later years various changes have taken place. In 1911, when steam traction was still exclusively in use, the locomotive depot was moved to Aebimatte. In 1937-41 the old steel bridge across the Aar gorge, at the northern entry to the station, was replaced by the magnificent four-track reinforced concrete Lorraine viaduct, with its central arch of 495-ft. span. Today the task of rebuilding and enlarging the entire station is making rapid progress. When the work is finished, practically none of the original station will remain.

Reduced Fares (1870)

We have the melancholy satisfaction of announcing that the railway fares between Hounslow and Waterloo stations have been reduced as follows: Single ticket, third class 10d., return 1s. 6d.; second class single 1s., return 1s. 8d.; first class single 1s. 3d., return 2s. In our opinion the management of the South Western Railway Company will have to make a much greater reduction before they cause the many hundreds of empty houses in the neighbourhood to be again

occupied, and which we have no hesitation in saying are empty solely on account of the ridiculous high price charged for the railway fares, and the time wasted on the journey. We hope that the company will give us a general season-ticket, to extend a certain number of miles, and that before long we shall be able to travel from Hounslow to Waterloo first-class at a cost not exceeding 50s. a quarter.—From "The Middlesex Chronicle," March 5, 1870.

Elephant Size

CHARGING OF ELEPHANT CUBS

Fossett's Circus

Difficulties have been experienced in obtaining proper charges for the conveyance of this firm's elephants by Passenger Service, in consequence of the firm maintaining that all five elephants used in their circus are cubs and chargeable therefore at G.5(E) Scale, Col. 1. The inter-regionally agreed definition of an elephant cub is "not exceeding 6 ft. in height from the ground to shoulder-level, i.e., to the ridge formed at the top of the shoulder-bone when the animal walks, and/or not exceeding five years old," and it has been established that two of Fossett's animals do not conform to this definition. Therefore in the event of these animals being forwarded by Passenger Service, charges must be raised as follows:

CHARGE

- 2 Adult Elephants, G.5(E) Col. 3 per animal.
- 3 Cub Elephants, G.5(E) Col. 1 or double G.5(3) Col. 1 per truck according to length of vehicle.—From a British Railways circular, quoted in "The Guardian."

Retarding the Patient's Recovery

There once was a hospital (give it no name)

Where health was but rarely restored,
For just as a patient got better there came

A change in the hospital board.

Re-organisation brought policies new
And even the doctors were switched;
So patients came under continual review
Operational wounds were unstitched.

Regional boundaries! Regional boards!
Sell the road transport to bleed you!
Devolve all the power of the generals' swords!

Decentralisation will feed you!

Legislation, inquiry, and every device
To keep all the patients unsettled
Were followed by Guillebaud's syrup, so nice
That it had all the management nettled.

So a Special Advisory Group they arrange
A Stedeford Knight in the lead,
When settled conditions, not policy change,
Are all that the railwaymen need.

GEE-ENNER



Train of aluminium stock, with match wagons inserted, approaching Dover en route to the Strasbourg exhibition

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

INDIA

New Third Class Sleepers

New design third class sleeper coaches, in which passengers travelling over 500 miles will be allowed to travel without the payment of any surcharge, are soon to be introduced on six long-distance trains, replacing the old type three-tier sleepers for which a surcharge of Rs. 3 per night per passenger is payable. The trains are Delhi-Howrah Janata express, Bombay-Dehra Dun express, Madras-Delhi Janata express, New Delhi-Howrah air-conditioned express, New Delhi-Bombay Central air-conditioned express, and New Delhi-Madras Central air-conditioned express. The actual date of the change-over will be decided by the Railway Administrations concerned. The Railway Minister recently announced that by the middle of next year all trains in the country covering more than 500 miles will have at least one new design third class sleeper coach.

NEW ZEALAND

Train Heating Vans

Construction of three train-heating vans at a cost of about £60,000 has been authorised. They will enable the "Night Limited" express trains between Auckland and Wellington to be hauled by diesel-electric locomotives instead of steam, with a consequent saving of at least an hour on each journey. This was announced on June 2 by the Minister of Railways, Mr. Michael Moohan, who said that, not only would the cleaner atmosphere and shorter journey time make the service more attractive, but

operating costs would also be substantially reduced.

Each of the three vans would be equipped with an automatic oil-fired boiler and storage tanks to hold enough fuel and water for the full journey. One van would be in use on each of the two trains, and one would be spare to allow for servicing and overhauls. The three new vans, to be built in New Zealand Railways workshops, will be equipped with imported heating units.

UNITED STATES

New G.E. Diesel-Electric Locomotive

The most powerful single-unit diesel-electric locomotive ever built in the United States, the "U25B," has been introduced by the General Electric Locomotive & Car Equipment Department. The new locomotive, the prototype of which will be put to domestic use, has been evolved from the universal type diesel-electric locomotives made by G.E. for use on railways outside the United States. These have been supplying motive power for major world railways since 1956 and have completed an estimated 30,000,000 miles of operation.

The "U25B" develops 2,500 h.p. and weighs only 260,000 lb., an exceptionally favourable power weight ratio for a diesel-electric. As a result it is capable of hauling trains at higher speeds. It is the first main-line diesel-electric locomotive offered by G.E. to the U.S. railways since the company pioneered the diesel-electric in 1925.

There are several features of interest incorporated in this new design. A 60 per cent reduction in electrical com-

ponents establishes a new standard of reliability. Filtered pressurised air is used throughout the locomotive ensuring complete freedom from dirt. A simplified engine cooling system eliminates all electrical apparatus, radiator shutters and clutch devices. The operator's cab is sound insulated.

BRAZIL

Improved Train Services

Leopoldina Railway has introduced steel passenger coaches, Brazilian-built, with adjustable armchairs on its Rio-Campos line. The fare is less than that charged by buses and the duration of the journey has been reduced to six hr.

E.F. Central do Brasil has inaugurated a luxury service between Rio and Volta Redonda consisting of motor coach and two trailers, with 196 adjustable seats, American bar, air conditioning, and separate adjustable lighting for each passenger.

Electric trains have started running between Sao Paulo and Mogi das Cruzes, with capacity for 198 passengers and a uniform fare of 50 cruzeiros; the duration of journey is one hr.

A separate operating company, subsidiary to the holding company, has been organised to administer the unified suburban services of the Leopoldina and Central Brazil Railways at Rio. The Central now has 115 electric trains running, carrying 650 passengers daily, and has completely renewed 300 miles of permanent way. The entire Leopoldina zone and part of the Rio d' Oro line will be electrified.

E.F. Santos-Jundiai has completed the electrification of its line from the terminus to Paranapiacaba, at the summit of the mountain; 90 stainless-steel passenger coaches have been assembled for the suburban services.

SWITZERLAND

New Signalling

In the middle of May a new signalling installation was brought into use by the Swiss Federal Railways at the main station at Basle. It controls all signals and points at the French end of the station, and the movements of trains to and from Munchestein on the Delémont line, and to and from the main goods depot.

A much larger signalling scheme is that proposed for the main station at Zurich, for which the administration is to set aside the sum of Sw. fr. 26,000,000. This is the first stage of the plan for rebuilding the entire station, and will greatly increase the capacity of the existing lines. Part of the plan is to remove the main goods depot to Oerlikon, and to connect it with the main station by means of a new line which will tunnel through the Käferberg.



Two G.E. 2,500-h.p. diesel-electric units coupled together to form a 5,000-h.p. locomotive

Western Australian Diesel-Electric Locomotive

General-purpose unit of 1,425 b.h.p. for operation over the Midland Junction-Northam Section



Class "A" 1,425-b.h.p. Co-Co diesel-electric locomotive

THE first unit of the latest addition to the Western Australian Government Railways' diesel-electric locomotive rolling stock has been received, and is now undergoing preliminary trials, which include the training of footplate staff prior to entry into full-time operation over the heavy Midland Junction-Northam section.

The Class "A" locomotive, of standard design, is to be used as a general purpose unit, and may be just as conveniently used as a shunter as well as a main-line locomotive, either hauling heavy goods trains, or passenger trains at speeds of up to 50 m.p.h.

In outward appearance, the new locomotive is similar to the Class "X" shunter, but on a larger scale. It is longer than the Class "X" locomotive, being approximately 50 ft. in length over the buffer beams. The main frame supports the engine and generator set, together with auxiliary equipment.

The frame is in turn mounted on two six-wheel bogies, each axle carrying a traction motor and transmission gearing. The main fuel tank of approximately 800 gall. capacity is slung below the main frame and between the two bogies, and all together go to form a very robust and compact locomotive unit.

Motive Power

The diesel engine is one of the latest models of the General Motors 12-cylinder two-stroke, 567 series, type "C" power unit, and is capable of developing 1,425 b.h.p. at 835 r.p.m. Auxiliary equipment, including the engine cooling fan, air compressor, exhaust auxiliary generator and traction motor blowers

absorb 115 h.p. at maximum output conditions, thus providing a net 1,310 b.h.p. for traction purposes. The main generator is directly coupled to the engine crankshaft, and is used solely to produce and supply direct current power to the six traction motors.

Engine cooling water radiator panels are mounted on both sides of the locomotive body arrangement, and a roof mounted fan, driven by the engine through a right-angled speed increaser drive box, provides the necessary air circulation for the radiator system. Thermostatically controlled shutters are used to control the air flow over the radiator banks, so that maximum operating temperatures may be maintained during engine working.

A combined air compressor-vacuum exhaustor unit, also directly driven from the engine crankshaft, serves to provide compressed air for the straight air braking system on the locomotive, and means of exhausting the train pipe and vacuum braking system on hauled trains. Compressed air is also used on the locomotive to operate a number of controls.

Control Equipment

The control cubicle, housing both the high-voltage and low-voltage switchgear, is placed immediately to the fore of the driving cab. The battery is carried to the rear of the cab and adjacent to the toilet compartment.

Dual control stations have been installed in the single cab, thus enabling a driver to work the locomotive in either direction without the need of having to turn the unit at terminal stations. All control levers, switches and foot pedals are placed to enable an average sized

man to drive with a maximum of comfort. The number of control levers used at each driving station, and their respective functions, remain the same as those used on the Class "X" locomotive. A number of gauges are supplied at each station, all within easy sighting of the driver; and they serve to indicate air pressures, brake pipe vacuum, locomotive speed, load current and battery charge current. At floor level, the usual deadman safety control treadle and sanding pedal are fitted at each station.

The weight of the locomotive is approximately 80 tons, all of which is available for adhesive purposes, thus providing a relatively high factor of adhesion with minimum possibilities of wheel slip occurring.

Operation of Locomotive

Generally, the principles followed in controlling the engine and main generator outputs are similar to those employed on the Class "X" locomotive. The driver, through the medium of the power controller, can select any one of eight engine speeds ranging from 275 r.p.m. at idling to 835 r.p.m. at full power. The eight notch positions are considered sufficient to provide incremental control of the draw bar horsepower or pull of the locomotive to cope with all track and load conditions.

There is also a complex automatic control system to ensure that the main generator absorbs maximum engine horsepower over the normal speed range of the locomotive. A load regulator similar in function to that used on the Class "X" locomotive is used to vary the main generator field strength to suit locomotive working conditions. To provide a wide speed range for the locomotive, and at the same time ensure that maximum horsepower may be developed throughout that range, a combined system of traction motor field weakening and variation in the motor connections to the main generator has been provided. At starting, the six traction motors are coupled to form three groups of two units in series-parallel connection to the main generator.

During acceleration, automatic traction motor field weakening takes place at a pre-determined main generator voltage. After a further increase of speed has taken place, a forward transition of motor connections is automatically made, which arranges all six traction motors to be connected in parallel to the main generator, and at the same time, returns the motor fields to maximum strength conditions. A still further increase in speed causes the shunting of the motor fields to take place a second time during the accelerating period, thus enabling still higher speeds to be attained. During deceleration, the whole of the process described above is reversed automatically.

(Continued on page 738)

Strengthening Tunnel Lining with Steel Plate

Lining with Armco steel plate, under traffic, of two sections of 70-year-old structure on Chesapeake & Ohio Railway



Sections of Armco steel liner plate being assembled into half-rings with trolley-mounted hoist ready to go into the tunnel

SOME 18 miles from Ashland, Kentucky, the Chesapeake & Ohio Railway direct line to Louisville passes through Williams Creek tunnel, 2,004 ft. long, to pierce the Appalachian Ridge. Constructed during the 1880s, the tunnel was completed in 1889. There were several roof falls during construction, necessitating the rebuilding of some sections. It was lined with locally-burnt bricks, and was a horse-shoe-shaped arch in section, 17 ft. high and 14 ft. 6 in. wide, for a single line of railway.

Brickwork Weakened by Engine Blast

Some strengthening work was done about 1900, and the tunnel remained in good order until 1935. It was then found that the joints in the brickwork in the crown of the arch had become weakened by the blast of locomotives. Accordingly, a 6-ft. wide strip of tar was applied under pressure to strengthen the joints. Thereafter no extensive maintenance works were needed until 1959.

In that year it was decided to provide further strengthening throughout an aggregate length of 406 ft. of the tunnel by the erection of an inner lining of Armco steel tunnel liner plate. The work was in two sections, one 252 ft. and the other 154 ft. long, and was carried out under traffic. In daytime there were only three trains regularly scheduled through the tunnel and four at night.

The procedure was for the sections of liner-plate rings to be collected near the tunnel mouth. There they were assembled into half-rings with the aid of a

small hoist mounted on a material trolley, which then carried them into the tunnel to the work site.

Mobile Work-Platform

A mobile work-platform was used for the erection, the two halves of each ring being bolted together, and to the adjacent

ring. On each side the rings rest on a longitudinal angle embedded in a concrete footing.

The work was done by the Chesapeake & Ohio Engineer's staff. Some 20 men were employed. Progress was expected to average 12 linear ft. a day. Actually, the best day's progress was 15 ft., but the average was seriously reduced by delays caused by unevenness of the brick lining, which had to be cut back in places to allow of a uniform curvature in the arch.

Western Australian Diesel-Electric Locomotive

(Concluded from page 737)

The locomotive has a nominal starting tractive effort of 54,000 lb. and a tractive effort of 50,800 lb. at 7½ m.p.h. In terms of train weights, the locomotive will have no difficulty in hauling 500 tons over the 1 in 40 gradients between Bellevue and Chidlow on the down journey, and 800 tons on the return up journey over the Northam-Koojeddah section at fast goods speeds. Proposed schedules provide that the locomotive will make three return trips to Northam from Midland Junction daily for the six days Monday to Saturday inclusive. All daily servicing and checking of the locomotive will be carried out at Midland Junction.

It is estimated that between 400 and 500 gal. of distillate fuel will be consumed daily. Delivery of the second locomotive of this class is expected from the builder, Clyde Engineering Co. Pty. Ltd., in July, 1960.



Portal of tunnel and barrel strengthened with liner-plate rings. Note the unstable overburden

Lifting Barriers at Courtybella Crossing, Newport (Mon.)

First installation in the country of double half-barriers complying with Ministry of Transport requirements



Courtybella Crossing, showing flashing signal on left, and barriers being lowered. The near side arm is lowered first

LIFTING barriers were recently brought into operation in the Western Region of British Railways at the four-track level-crossing at Courtybella, between Newport (Mon.) High Street Station and Bassaleg. The barriers were designed and manufactured by the Signal Engineer's staff and works at Reading. They are the first lifting barriers to be installed on the Region and are believed to be the first double half-barriers in this country, to comply in full with the Ministry of Transport's provisional requirements.

Operated by an electro-hydraulic system, the barriers are controlled from the crossing-keeper's hut. There is an interlocking arrangement with Courtybella signalbox, approximately 200 yd. from the crossing. Communication between the crossing keeper and the signalman at Courtybella is by bell and telephone.

Control Equipment

A pedestal in the crossing-keeper's hut carries a control switch, emergency control switch key, operating push button and two three-position indicators. The control switch has two positions for raising and lowering the barriers. One of the indicators shows the position of the barriers—during their movement its needle points to a blank sector of the dial. The other indicator shows whether the road signals are "off," "on flashing," or "on partial failure."

The emergency control switch key enables the barriers to be operated from a position adjacent to the crossing in circumstances when it would be impossible to operate them from the control pedestal, e.g. during a complete failure of the road signals.

A barrier release lever mechanically interlocked with the signalling, and electrically interlocked with the control equipment in the crossing-keeper's hut, is provided in the Courtybella signalbox. Indicators in Courtybella signalbox and the crossing-keeper's hut show in the one case when the barrier release lever is free to be moved and in the other when the barriers are free to be raised.

Seen from the roadway the wooden

booms taper from 8½ in. at the fulcrum to 3 in. at the tip. In plan, each boom is made up of two beams, cross braced at intervals, which straddle their respective pivot posts at one end and then converge towards the tip. The booms are 21 ft. long on the Cardiff Road side of the crossing and 19 ft. long on the Mendalgief Road side.

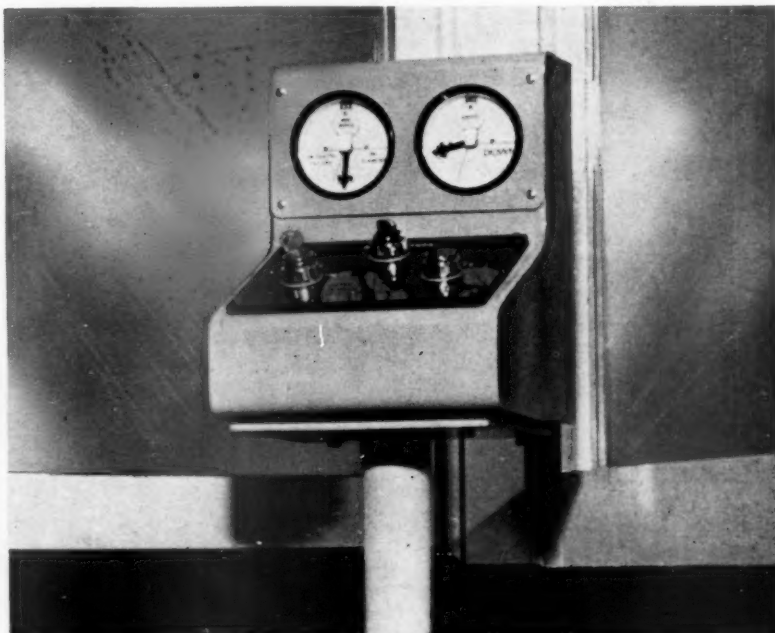
Skirts of light alloy rods and sections hang from the booms, the whole assembly being painted in alternate bands of white and red. The left hand booms are fitted with 18 in. dia. reflecting targets, and all booms carry two 6-W. electric lamps. Targets and lamps are adjustable to the angle of the approach road.

Hydraulic Equipment

Each boom is driven by a double-acting hydraulic ram, the hydraulic fluid pressure being generated by a three-cylinder pump coupled to a 24-volt electric motor. The direction of movement of the ram is determined by energising one or other of two normally closed solenoid valves.

The hydraulic system is fitted with two relief valves, one set at 1800 p.s.i. the other at 2600 p.s.i. Between them, these valves ensure that abnormal pressures are not created in the system under working conditions and that any thermal expansion which occurs is safely absorbed. In addition, two manual release valves are fitted. When these are unscrewed the booms may be moved manually, in the event of electrical or hydraulic failure.

The movement of the barriers is controlled by a signalling type neutral



Pedestal-mounted control unit in crossing-keeper's hut, showing control switches and three-position indicators

polar relay, housed in a location cupboard adjacent to the crossing. Also in this cupboard are Post Office Type 3000 relays, in a dustproof box, which control the flashing of the road signals, as well as the delay between flashing commencing and the lowering of the barriers. The Post Office type relays also take care of energisation of the appropriate solenoid valves and of the contactors supplying power to the electric motors on the hydraulic apparatus. Proving that the filaments in the road signal are intact and that they are flashing when required to do so, is also done with Post Office type relays.

Proving Equipment

Contact boxes are fitted to the booms and suitable contacts, in series, show the barriers to be either fully up or down. A neutral signalling relay is used to prove the barriers down. Further contacts are used to achieve sequential lowering of the barriers, i.e., the left-hand booms must be fully down before the right-hand booms commence to fall. All the booms, however, are raised simultaneously. An additional safeguard which caters for the possibility of the electric motor running indefinitely, is a thermostat-operated device which automatically cuts off the feed to the motors after two minutes continuous running.

The power supply for the installation consists of a 24-volt heavy duty battery, having a nominal capacity of 100 ampere-hours. The battery is kept fully charged by a constant potential battery charger.

Location cupboard wiring has, wherever possible, been carried out in P.V.C. covered wire. The cabling between location cupboards, booms and road signals is done with composite vulcanised rubber and PCP compound insulated, PCP sheathed cable.

The barriers are lowered in sequence, the left-hand arms coming to the horizontal position before the right-hand arms begin to move. All four barriers are raised together. Twin red flashing road signals begin to operate 5-6 sec. before the barriers are lowered and continue to flash until they are down.

Bell Code

To work a train over the crossing, the signalman at Courtybella Junction Signalbox gives one long ring on the bell for the barriers to be lowered. The crossing-keeper repeats the bell-signal in acknowledgment, turns the control switch to the "lower" position and depresses the "operate" push-button. These actions lower the barriers and activate the road signals. The barriers begin to fall 5-6 sec. after depression of the button, which must remain depressed until the gates are completely closed and shown to be so by the appropriate indicator.

As soon as the train has passed, the crossing-keeper gives two long rings on the bell. When this signal is repeated by the signalman, the crossing-keeper turns the control switch to "raise." He keeps the button down until the indicator shows the barriers to be "up."

When the signalman requires a second train to pass before the first, he notifies the crossing-keeper by telephone. The crossing-keeper gives two long rings on the bell immediately each train has passed over the crossing, and each signal is acknowledged by the signalman. The crossing-keeper may not raise the barriers until the second train has passed and he has received the signalman's acknowledgment of this fact.

If the needle of the flashing road signals indicator points to "on partial

failure," the signal lineman is notified. Should the barriers fail to respond to correct operation, the signalman is informed. He then gives the crossing-keeper permission to use the emergency-control key.

The crossing-keeper also takes the emergency-control switch cupboard key and stops all approaching road traffic. He then operates the barriers from the emergency-control switch cupboard.

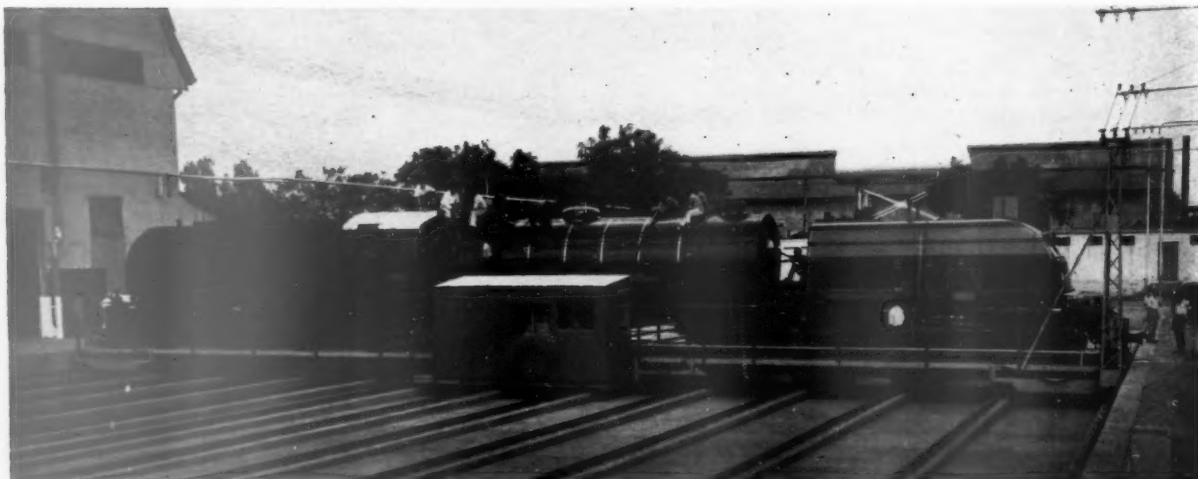
When the barriers are correctly positioned, he re-locks the emergency-control switch cupboard, returns to his hut, replaces the two keys and informs the signalman by telephone that barriers and controls are correctly placed. The crossing-keeper may not operate the barriers again until instructed to do so by the signalman.

Emergency Operation

If the barriers fail to respond to the emergency-control switch, the crossing-keeper sets the switch to "stop" and re-locks the cupboard. He then replaces the cupboard key in its box and puts the emergency-control switch key in a safe place. He then informs the signalman that he cannot operate the barriers with the emergency-control switch, and obtains authority to use the key to the hydraulic equipment covers.

With this key, after ensuring that the control switch is in correct position, he goes to each barrier in turn, removes the back of the barrier-mechanism guard, unlocks and lifts the covers of the hydraulic apparatus, and turns the barrier release valves to the open position. He then replaces and re-locks the hydraulic apparatus covers. The barrier is now free to be operated manually. When hand-operated, the barriers must move to the full extent of their travel.

New Traverser for East African Railways & Harbours



Locomotive traverser built by S. H. Heywood & Co. Ltd. for the East African Railways & Harbours and recently put into service. The longest traverser in Africa, it is 240 ft. long and 100 ft. wide, and has a maximum carrying weight of 260 tons

British Railways Diesel-Electric Pullman Trains

High-speed six- and eight-car units for extra-fare services in London Midland and Western Regions



Eight-car diesel-electric Pullman train of Western Region on trial run

FOLLOWING an extended period of service trials British Railways will shortly introduce the first of a batch of de luxe diesel-electric Pullman trains designed for high-speed travel with superior standards of comfort and a personal service of meals and refreshments for all travellers. These trains, which have been supplied to British Railways by the Metropolitan-Cammell Carriage & Wagon Co. Ltd., are powered by two 1,000-h.p. NBL/MAN diesel engines, each direct coupled to a G.E.C. main generator.

The complete order is for five trains, two of which are six-car trains for first-class passengers only, and three are of eight cars with first and second class accommodation.

The six-car trains will run in the London Midland Region, on the main line of the former Midland Railway, between Manchester Central, London St. Pancras, and Leicester, and the eight-car trains in the Western Region between Bristol, London Paddington, and Wolverhampton, Birmingham and Paddington.

Enclosed Saloons

Passenger accommodation is in enclosed saloons and all seats on the de-luxe trains are reserved. The driver and guard are linked by Loudaphone and a public address system is installed throughout the train. Underfloor-mounted diesel-driven generating sets supply power for lighting and auxiliary services.

The livery is Nanking blue, relieved by a broad white band extending the length and width of the windowed section

along the sides of each car. The rounded nose of each motorcar bears the Pullman Car Co. Ltd. crest, and this is also carried on the white-painted band, between the last pair of windows on each vehicle. The roofs are painted light grey, the underframes aluminium, and the bogies black.

Principal dimensions and data are as follow:—

Maximum service speed	...	90 m.p.h.
Weight of train — 6 car	...	299 tons
Weight of train — 8 car	...	364 tons
Fuel capacity	...	1,000 gal.
Length of vehicles over body—		
motor car	...	66 5½
trailer car	...	65 6
Overall height	...	12 4½
Overall width	...	9 6
Bogie centres	...	46 6
Bogie wheelbase	...	9 6

The six-car trains are made up of two power cars, two combined kitchen and passenger cars, and two parlour cars. In the power car the cooling group, with side radiators and roof-mounted fan, is immediately behind the driving cab bulkhead. A bulkhead across the generator, with doors at each side, divides the engine and generator compartments. Separate cubicles are used for housing the h.t. and l.t. equipment.

Sound-Insulated Partitions

Adjoining the generator compartment is the guard and luggage compartment, the partitions of which are sound-insulated. This compartment has access doors to the passenger saloon and to the power compartment.

The saloon accommodates 12 passengers; at the gangway end is a ladies'

toilet on one side and a small luggage compartment on the other.

The passenger accommodation in the kitchen car is an 18-seat non-smoking saloon. At the gangway end is a toilet and luggage and equipment cupboards. Adjacent to the saloon is the pantry, and at the gangway end of the kitchen is the staff accommodation. In the parlour car 36 seats are provided, with a toilet and a luggage compartment at each end. In the six-car train the total seating is 132 first class.

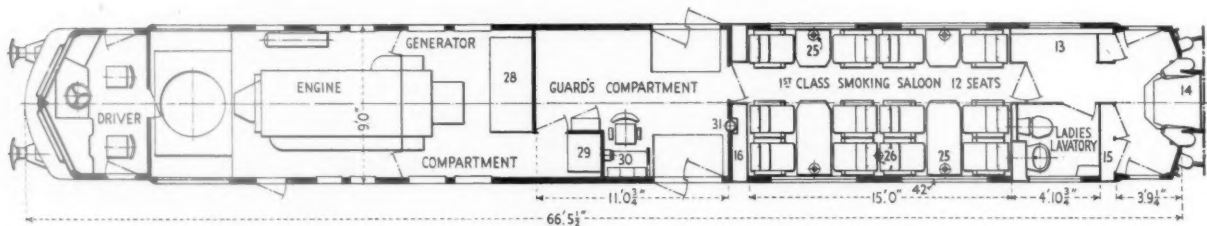
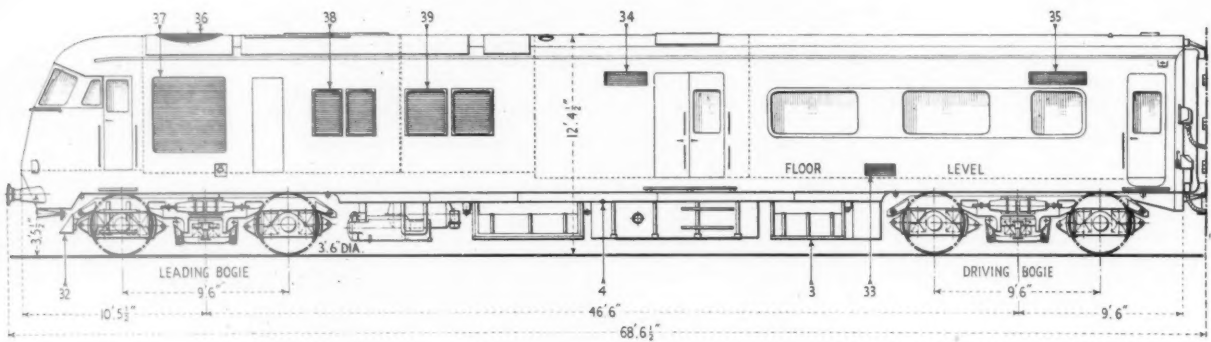
The eight-car train has additional seating in the power cars and in two additional parlour cars for second class passengers. The total seating capacity is 228, 108 of which are first class and 120 second class.

Special Gangways

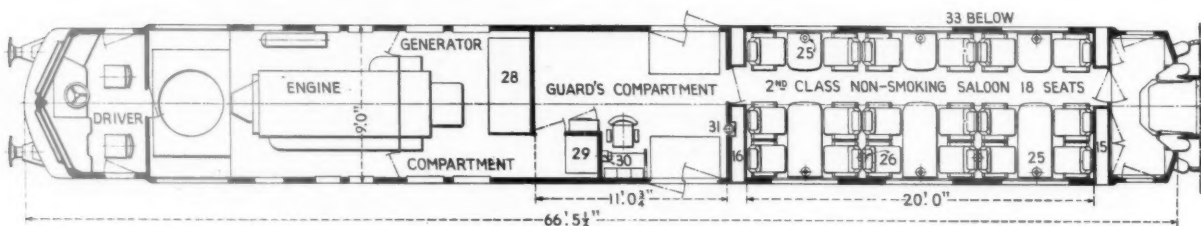
The entrance vestibules at the ends of the cars are wide and spacious, and the access gangways between the cars are also wider than normal width. The gangways are mounted on pivots at the ends of each vehicle. When joined together these semi-floating units between pairs of cars form a level platform free from the normal gangway oscillation. Rubber seals cover the outside of the gangways and prevent draughts and loss of conditioned air.

Temperature Control and Insulation

The complete train is fully air-conditioned with automatic control of air temperature and humidity. The inward flow of air to the saloons from the air-conditioning plant is through outlets

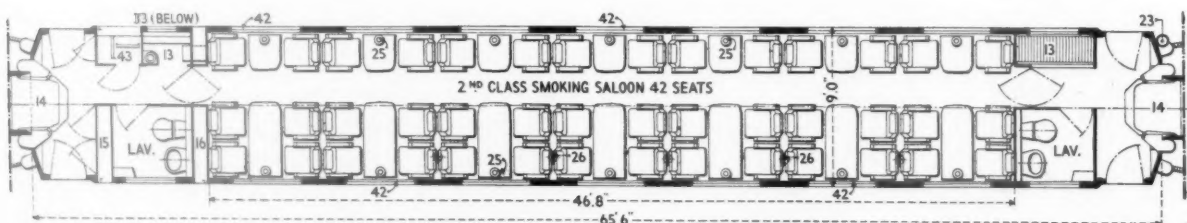
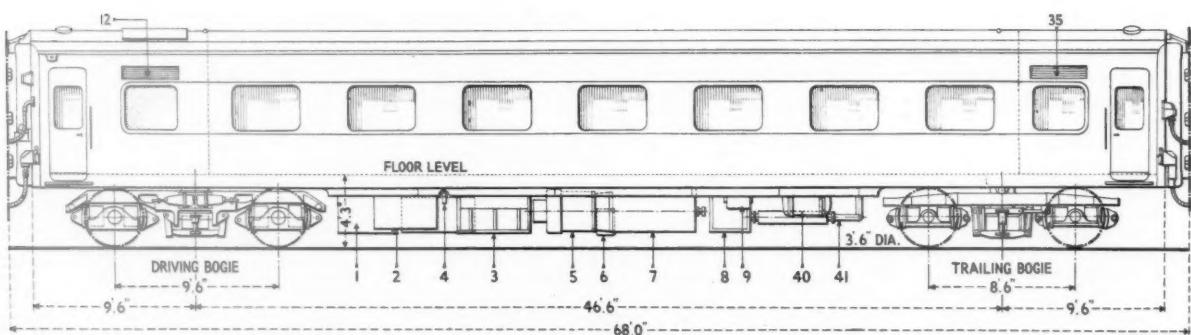


MOTOR CAR - TYPE 1



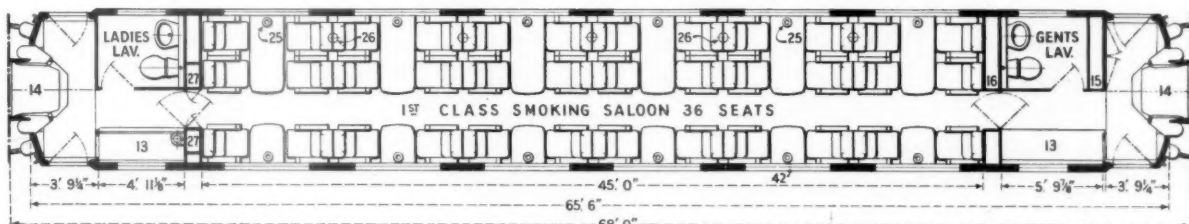
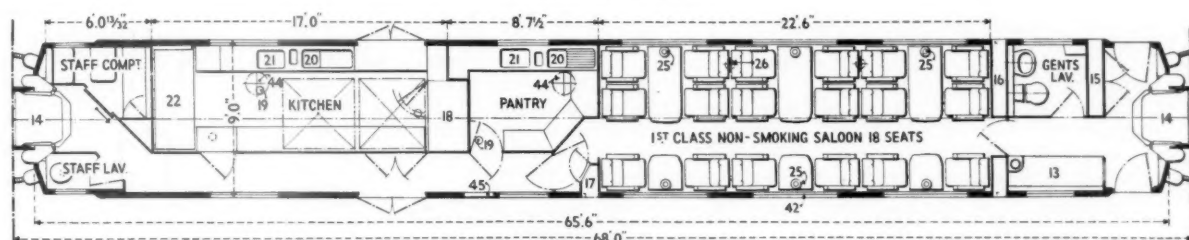
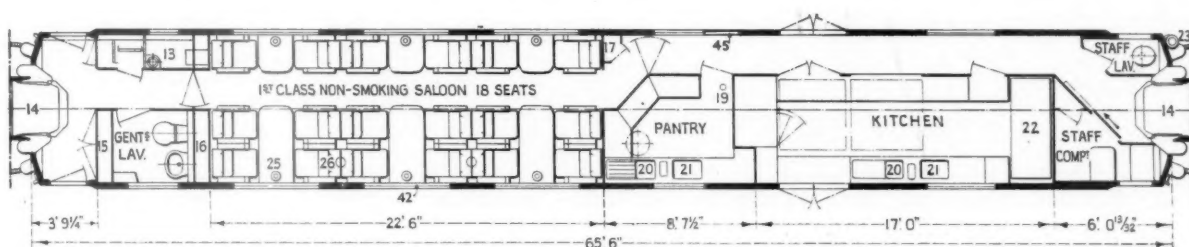
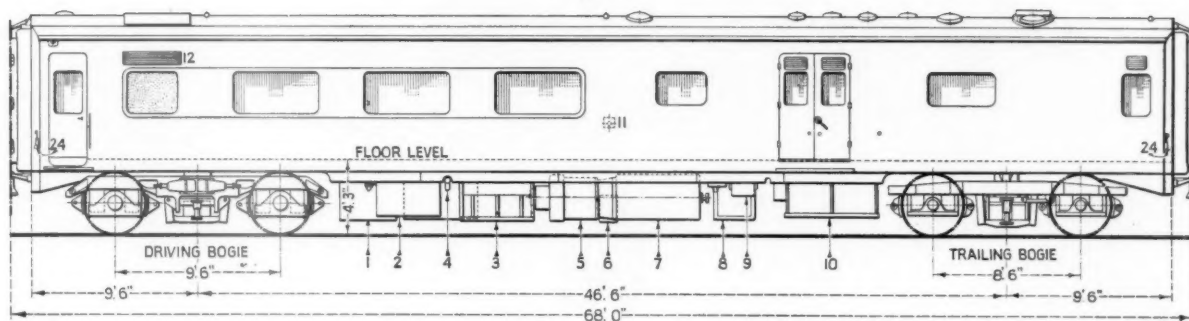
MOTOR CAR - TYPE 2

Elevation and alternative plan layouts of power cars Types "1" and "2" for diesel-electric Pullman trains of London Midland and Western Regions respectively



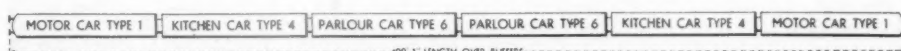
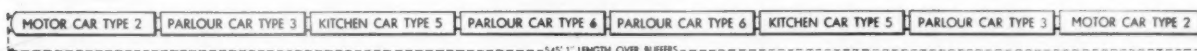
PARLOUR CAR - TYPE 3

Elevation and plan layout of parlour car Type "3" with underslung diesel-alternator for lighting and air-conditioning, Western Region eight-car set



- | | | | |
|---|-------------------------------------|--|--|
| 1 Condenser | 13 Luggage | 25 Table lamps | 37 Radiator air intake |
| 2 Contactor switch box | 14 Rubber tread | 26 Loudspeakers in ceiling | 38 Engine air intake |
| 3 24-V. battery | 15 Control panel | 27 Locker | 39 Generator air intake |
| 4 Fuel tank filler both sides | 16 Filter chamber | 28 H.T. cubicle | 40 Reservoir |
| 5 Alternator | 17 Fuse and linen cupboard | 29 L.T. cubicle | 41 Exhaust pipe |
| 6 Air filter | 18 Refrigerator | 30 Microphone | 42 Double glazed windows, venetian blind between |
| 7 Auxiliary engine | 19 Floor drain | 31 Fire extinguisher | 43 Instruments |
| 8 Radiator | 20 Steriliser | 32 Bracket for A.T.C. receiver | 44 Vent-Axia fan |
| 9 E.P. brake unit | 21 Sink | 33 Motor air intake | 45 Service indicator box |
| 10 Gas cylinders | 22 Gas range with fume chamber over | 34 Air conditioning intake and filters | |
| 11 Radiator header tank filler | 23 Silencer | 35 Air conditioning exhaust | |
| 12 Air conditioning exhaust and air intake filter on opposite sides | 24 Tank filler | 36 Radiator exhaust fan | |

Diagrams of kitchen cars and parlour cars of London Midland and Western Region diesel-electric Pullman trains



Block diagrams showing formation of complete double-end six- and eight-car trains



Interior of first class parlour car showing armchair seating

in a duct concealed by the central lighting panel. Fully adjustable venetian blinds are fitted between the glasses of the double-glazed windows. Particular care has been taken to achieve a high standard of sound insulation, and track noise has been reduced to a low level. The insulated floors are fully suspended.

Adjustable Reclining Seating

In each car the seating is arranged in facing pairs on one side of the passenger gangway and in facing individual seats on the other, with double or single fixed tables respectively set between them. All seating is of the armchair type with deep foam-rubber cushions upholstered in red or blue striped fabric trimmed with black and grey plastic hide. The first-class seats can be adjusted from the reclining to the upright position and are mounted on runners for fore and aft adjustment at the table. In the second-class saloon the seats are of the same armchair type but are not adjustable.

Elegant Décor

The interior décor, which varies from vehicle to vehicle, has been chosen to give pleasing and colourful combinations, mainly of decorative rosewood and ebony veneers, grey plastic hide, plastic facings, and contrasting seat upholstery. The partitions forming the ends of each passenger saloon are decorated with wood veneers and abstract plastic inlays. Each partition has glazed panels in the access door, the glass having a vertical striped pattern which acts as a mirror but allows unimpeded vision at close quarters.

The bodyside walls are faced with plastic hide from floor level up to the continuous hand-luggage racks running along the length of each passenger saloon. Above the racks, walls and ceiling surfaces are lined with plastic in pearl-grey, with a fine black-line pattern superimposed which continues up to the central lighting panel in the ceiling.

The exposed parts of the hand-luggage racks, the table edges, and window surrounds are all of anodised aluminium, satin finished in aluminium for the first class and in pale gold for the second class. The heater grilles, mounted low on the bodyside alongside the seats, are of satin-finished stainless steel.

Floor carpets, in kingfisher blue or cardinal red, are fitted on plastic underlays. The walls of the entrance vestibules at the car ends are faced in pearl-grey plastic, with plastic hide trimming around the inter-car gangway entrances. Coir mat floor covering is used in the vestibules.

Fluorescent Lighting

In each saloon the main lighting is by twin warm-white fluorescent tubes in the centre of the ceiling, supplemented by tungsten lamps fitted in the luggage

racks above each table. The fluorescent tubes are placed end-to-end and covered by flush-jointed diffusion panels. When illuminated the tubes show as a continuous panel of light running the length of the saloon. Individual table lamps with glass shades are mounted on swan-necked pillars fixed to the bodyside just below window level. Battery operated emergency lighting is also installed.

Hygienic Kitchen

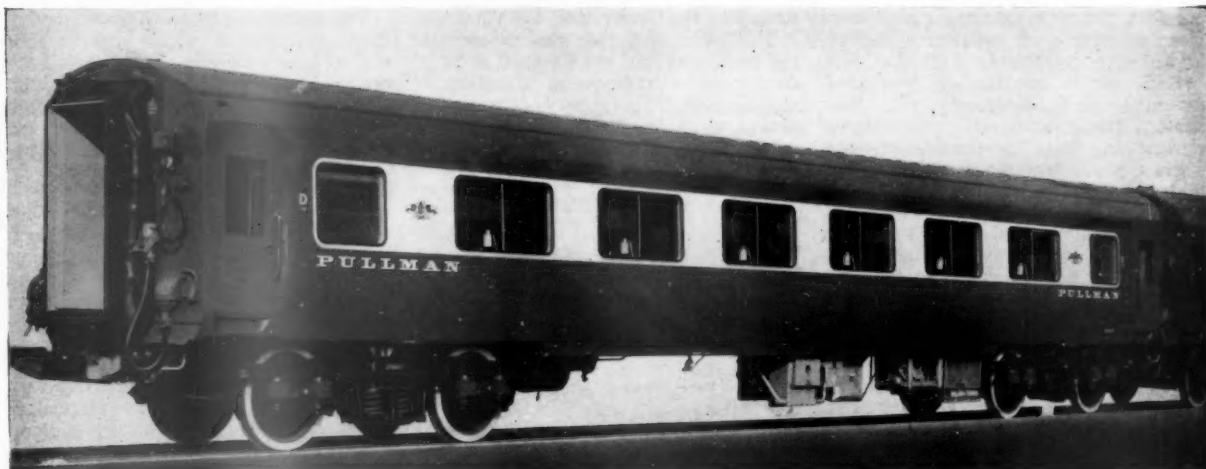
The kitchen and pantry accommodation is well arranged for ease of working under the most hygienic conditions. The gas cooking range is fitted across one end and the refrigerator adjacent to the pantry partition. Two of the four extractor fans are located above the cooker. Working tops are arranged on the corridor side, with the sinks, sterilising units, and water boilers along the bodyside. All kitchen utensils, sink units, and working tops are in stainless steel. The walls are lined with pearl grey plastic finish and the ceilings matt white. The floors are of red composition material set in a 2 in. square mesh aluminium grill. A staff compartment and lavatory are provided adjacent to the gangway entrance to the car.

The equipment of the well-appointed toilets includes towel dispensers and hygienic spray washing facilities which give an automatically timed flow of water. Water temperature of the timed flow can be regulated as required. The walls are plastic-faced in flame, clover pink, and grey, and the ceilings painted matt white. Coloured mosaic paving is used for the floor. Metal fittings are finished in satin chromium plate, with the exception of the skirting beadings of satin-finished anodised aluminium and the satin-finished stainless-steel heater and ventilation grills. Separate toilet accommodation is provided for ladies.

Power for the main and auxiliary generators is supplied by the NBL/MAN 12-cylinder supercharged diesel engine type L12V18/21BS having a 12-hr.



Space-saving layout of equipment in kitchen car



First class parlour car exterior showing Metro-SIG gangway

rating of 1,000 b.h.p. at 1,500 r.p.m. Cylinder dimensions are 180 m.m. bore and 210 m.m. stroke. A considerable number of engines of this type are in use for diesel-electric and diesel-hydraulic traction.

Individual cylinder heads are of the pre-combustion type, provided with two inlet and two exhaust valves. Supercharging is by a Napier exhaust-gas turbo-blower mounted above the generator drive. At the free end of the engine is the crankshaft-driven pump for the hydraulic-motor fan drive. C.A.V. fuel injection equipment and an Ardeigh governor are fitted. Lubrication priming before starting is by a Mirreles pump driven by a G.E.C. motor. A belt-driven Dowty pump feeds the fuel-service tank.

Warning lamps are fitted to indicate low water level, high water temperature, low oil pressure, overload, and earth fault, and the engine speed is automatically reduced to idling in the event of high-water temperature, overload, or earth fault. In each driving cab is fitted a general warning light and a light to indicate when an engine has stopped.

The combined engine/generator unit is mounted on a common fabricated-steel bedplate and installed on Metalastik anti-vibration mountings. The use of a quick-running vee engine results in a good power-weight ratio.

Cooling Group

The Serck cooling group, comprising vertical radiator panels in the bodyside and roof-mounted extractor fan, is positioned behind the cab bulkhead in the power car. The cooling fan, which is 45 in. dia., is driven at the correct speed to suit the cooling required by the Serck-Behr hydrostatic fan drive. The hydraulic fan motor is supplied with oil under pressure by the engine-driven pump, via a thermostatically controlled by-pass valve. Until the engine coolant reaches the minimum operating temperature the pump delivery is by-passed to the oil tank; during this time the fan remains stationary. At normal operating temperatures the by-pass is closed and the resulting oil pressure rise causes the radiator shutters to open and the fan to

be driven at a speed corresponding to the amount of cooling required. Access from the cab to the power compartment is through the radiator tunnel.

Main and Auxiliary Generators

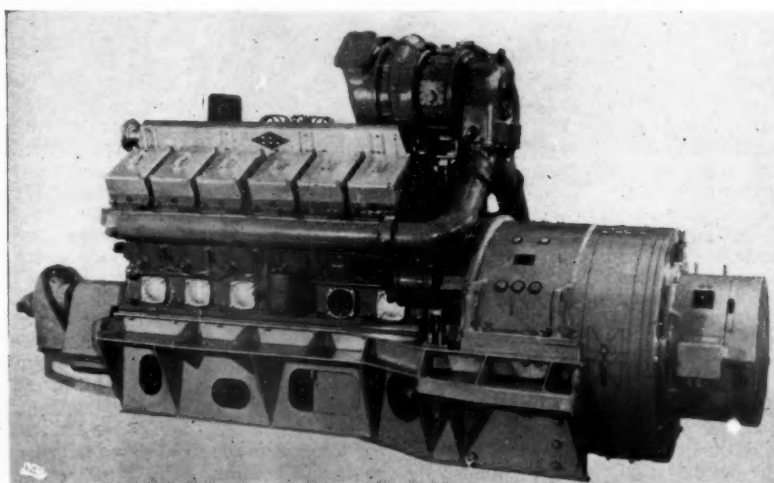
The main generator is a self-ventilated single-bearing machine with windings for separately excited, and self excited main fields and a series decomposing winding. This also forms part of the series excitation for motoring the generator for engine starting. The continuous ratings at 1,500 r.p.m. are 1,700A. 383V. or 1,250A. 523V., 650 kW.

The armature shaft also carries the armature of the auxiliary generator mounted at the rear end. The ventilating fan at the drive end draws cooling air through both machines. The auxiliary

The main generator output is controlled by an automatic load regulator, which in turn is controlled by the engine speed governor. This method of control ensures that the full engine output available at each notch setting made by the driver is maintained over a wide range of train speeds. The power output of the generators at each end of the train is accurately synchronised. Protection against wheel slip is provided by a current limiting relay. A special form of jumper connection between the cars uses butt contacts to eliminate possible misalignment with the plug-and-socket type.

Air-Conditioning Equipment

The air-conditioning system is designed to provide and maintain an automatically controlled clean comfortable atmosphere



NBL/MAN 1,000-b.h.p. diesel engine and G.E.C. main generator

generator is rated at 91A. 110V. 10kW., the voltage being held within close limits throughout the engine speed range by a Newton automatic voltage regulator. This generator supplies excitation for the main generator and current for starter-battery charging, control circuits, and other auxiliaries.

within established limits of temperature and humidity irrespective of outside ambient conditions. This requires provision for heating, cooling, air filtration, car insulation and a degree of manual temperature selection for service requirements. In addition to the attraction of a high standard of passenger

comfort, the air conditioning also keeps clean and fresh the upholstery, fittings, and other appointments.

Each car is equipped with a roof-mounted air-conditioning unit, floor heaters, automatic control panel, and a refrigerating unit. The conditioning unit filters the air, removes excess moisture, and either cools or heats the air as required.

A proportion of the air in the car is extracted by roof ventilators and this is made up by admitting filtered fresh air into the system. Heating is by electric heaters and cooling is by flowing the air over the evaporator coils of the refrigerator. Excess moisture is deposited as dew on the cold coils of the evaporator.

The motor-driven compressor and condenser are mounted on the under frame and use Freon 12 or Arcton 12 as a refrigerant. The condenser is cooled by two motor-driven fans. The manual temperature-control switch enables the heaters to be switched on at car temperatures of 68°F., 71°F., or 74°F., automatic control being by Vapor thermostats. To ease the load on the power supply if the air-conditioning compressors throughout the train were switched on simultaneously, a delay switch is fitted to give a sequence switching throughout the train.

Auxiliary Power Supply

Current for lighting, air conditioning, refrigeration, battery charging, and ancillary equipment is supplied by two underfloor generating sets, each set comprising an eight-cylinder Rolls-Royce horizontal diesel engine direct coupled to a Stones Tonum alternator. The output of one set is sufficient for normal summer and winter requirements; the second set is carried for use as a standby and for use under extreme conditions. The engine is rated at 190 b.h.p. at 1,500 r.p.m. and the three-phase 50-cycle alternator at 133 kVA, 400V.

In the six-car train the generating sets are mounted underneath each of the kitchen cars and in the eight-car trains they are underneath the second class parlour cars.

Provision is also made for the operation of the lighting, refrigeration, and air-conditioning equipment from an external three-phase a.c. supply when the train is stationary. Static power supply points are being provided at terminal stations on the routes to be served by these trains.

Auxiliary Power Distribution

The 400 V. a.c. three-phase 50-cycle power for lighting and air conditioning is distributed by two four-wire feeders running the length of the train. Connections between the cars are made through Stone Kleops intercar couplings, and the circuits so arranged that if a coupling is broken the feeder is immediately disconnected from the power supply. The bulk of the lighting is supplied at 230 V. a.c. by phase-to-neutral connection of the 400 V. feeders, and the remainder is supplied at 110 V. a.c. from a 230/110 V. lighting transformer. The compressor, condenser-fan motor, and the floor and air heaters are con-

nected to the three-phase, 400 V. supply.

The air-conditioning fan motor and the control circuits are supplied at 24 V. d.c. from a three-phase transformer/rectifier unit. This supply is also used to charge a 24 V. 216 A.h.r. battery for auxiliary engine starting and emergency lighting.

Bogies and Traction Motors

The bogies are of the Metro-Schlieran type incorporating hydraulically damped helical springs. At each end of the train formation there are two traction motors in the inner bogie of the power car and two in the adjacent bogie of the vehicle coupled next to it, making eight axles motored in a train of either six or eight coaches.

The unsprung weight on the axle is reduced to a minimum by carrying the motor on a three-point mounting on the bogie frame. To accommodate the relative vertical movement of the axle and motor the motor drive is taken through a Brown Boveri spring drive unit. On the motor shaft is mounted a single-helical reduction gear meshing with the axle-drive gear which is mounted on a quill shaft carried on roller bearings. In the face of the gear is a ring of spring-loaded pads which engage with face-dogs integral with a spider pressed on the road wheel hub. Thus the gears are maintained at the correct centres while allowing free vertical movement between axle and motor.

The motors are four-pole self-ventilated machines with a continuous rating of 425 A. 383 V. 199 h.p. at 1,360 r.p.m. and a gear ratio of 19/67. The two motors in each power bogie are in parallel. Current for the inner-vehicle power-car motors is supplied through cables attached to the adjacent power car.

Braking at High Speed

Special features are incorporated in the Westinghouse air brake equipment to maintain the high efficiency at high speeds. Control is by electro-pneumatic valves and at train speeds at which normal braking is required the degree of standard brake pressure applied to the cylinders is proportional to the position of the driver's brake controller.

In the high speed range the brake pressure is automatically increased to compensate for the lower co-efficient of friction of the cast-iron shoes when operating at high speeds. The change-over from high speed to normal speed braking, and vice versa, is entirely automatic and is controlled by a valve energised by current from the speedometer generator. The de-luxe Pullmans are the first trains to be fitted with two-stage e.p. braking.

Operating through switch contacts in the controller, the standard brake valve handle is also used to control the automatic brake for emergency use. The brake equipment incorporates the latest type of Westinghouse rubber-seated valves and O-ring packings for ease of maintenance. The brake cylinders, fitted with slack adjusters, are externally mounted on the bogie frame and operation is through fully compensated clasp brake rigging.

The permanent type of coupling between the coaches, which absorbs both buffing and drawing loads, has been designed to provide a smooth pick-up on starting and stable running at high speed. Normal coupling hooks, for emergency use, are in concealed recesses in the nose of each of the leading motor cars of the train.

These de-luxe trains have been built to the requirements of the British Transport Commission under the general direction of Mr. J. F. Harrison, Chief Mechanical Engineer, British Railways Central Staff, in collaboration with Messrs. S. B. Warder, Chief Electrical Engineer, and F. Grundy, Chief Traffic Officer, and the Pullman Car Co. Ltd. Mr. A. E. Robson, Chief Mechanical & Electrical Engineer, London Midland Region, was responsible for inspection and for test running. Mr. Jack Howe acted as consultant to the Metropolitan-Cammell Carriage & Wagon Co. Ltd. on passenger amenities and décor.

Sub-contractors included the following:

Traction equipment ...	General Electric Co. Ltd.
NBL/MAN engines ...	North British Locomotive Co. Ltd.
Air-conditioning and lighting ...	J. Stone & Co. (Deptford) Ltd.
Auxiliary engines ...	Rolls-Royce Limited
Electro-pneumatic brakes ...	Westinghouse Brake & Signal Co. Ltd.
Kitchen stoves ...	Radiation Limited
Sink units ...	James Stott & Co. (Engineers) Ltd.
Kitchen floors, laid by Toilet commodes and basins ...	Durastic Limited
Bodyside door castings	Twyford Limited
Droplights (kitchen door) ...	Deans & Sons (Yorkshire) Ltd.
Droplights (guard's door) ...	Etablissements Georges Klein et Cie.
Droplights (guard's door) ...	Beckett, Laycock & Watkinson Limited
Carpets (first class) ...	S. & J. Stockwell & Co. (Carpets) Limited
Carpets (second class) ...	Tomlinsons Limited
Seat castings ...	G. D. Peters & Co. Ltd.
Seat cover materials ...	Edinburgh Weavers Limited
P.V.C. coverings (first class) ...	Hunt & Winterbotham Limited
P.V.C. coverings (second class) ...	I.C.I. Limited
Interior window units	Henry Hope & Sons Ltd.
Venetian blinds ...	Crittall Manufacturing Co. Ltd.
Plastic panels (saloon ceilings) ...	Bakelite Limited
Plastic panels (toilets)	Holoplast Limited.
Interior timber partitions ...	Formica Limited
Body-shell insulation	Edmonton Panel Co. Ltd.
Interior insulation ...	J. W. Roberts Limited
Ascot heaters ...	W. Gilmour Smith & Co. Ltd.
Lavatory mosaic flooring ...	Ascot Gas & Water Heaters Limited
Public address system	Carter & Co. Ltd.
Dunlopillo seat cushions	Clifford & Snell Limited
Springs ...	Dunlop Rubber Co. Ltd.
Axleboxes ...	English Steel Springs Corporation Limited.
Buffer springs ...	Skefko Ball Bearing Co. Ltd.
Paint ...	G. Spencer Moulton & Co. Ltd.
Engine/generator mountings, bogie bushes, etc. ...	Docker Bros. Ltd.
Fire protection equipment ...	Metalastik Limited
Heat-demisters, driver's compt. ...	Graviner Manufacturing Co. Ltd.
Warning horns ...	S. Smith & Sons Ltd.
Windscreens wipers ...	Desilux Electrical Equipment Limited
Buffers, hydro-pneumatic	Trico-Folberth Limited
Pipe fittings ...	Geo. Turton Platts & Co. Ltd.
Drivers' & guards' seats	British Ermeto Corporation Limited
Metallic fittings, locks, etc. ...	A. W. Chapman Limited
	J. Beresford & Son Ltd.
	Jones & Foster Limited
	J. Kaye & Sons Ltd.
	Taylor & Osbourne Limited

RAILWAY NEWS SECTION

PERSONAL

Mr. N. L. Collins, Trains Assistant, Waterloo, Southern Region, has not yet retired, as recorded in error in our June 17 issue, but will be retiring on August 31.

Field-Marshal Sir William Slim, on whom, as recorded in the list of Birthday Honours in our June 17 issue, a Viscounty has been conferred, was born in 1891, and educated at King Edward's School, Birmingham. During

It is reported that Dr. Okechuku Ikejaini has been appointed Chairman, Nigerian Railway Corporation.

The following retirements have been announced by the Malayan Railway Administration: Mr. P. B. Brokenshire, Chief Accountant, Mr. M. P. V. Hannam, Principal Administrative Officer, Mr. Lim Cheng Chuan, Assistant Traffic Superintendent, and Mr. R. G. Fleeton, Secretary, Malayan Railway Administration.

Mr. W. H. McFadzean, on whom, as recorded in the list of Birthday Honours in our June 17 issue, a Knighthood has been conferred, was born in 1903 at Stranraer, Wigtownshire, and educated locally. He joined the British Linen Bank and took his Associate Membership of the Institute of Bankers. In 1927 he went to Glasgow University to study accountancy, and soon qualified as a Member of the Institute of Chartered Accountants & Actuaries. His first position on leaving the University was



Field-Marshal Sir William Slim

On whom a Viscounty has been conferred in the Birthday Honours List



Mr. W. H. McFadzean

On whom a Knighthood has been conferred in the Birthday Honours List

the 1914-18 war he served in Gallipoli, France, and Mesopotamia. During the recent war he held high commands, culminating with his appointment as Commander-in-Chief, Allied Land Forces, South-East Asia. His connection with railway affairs dates from 1947, when he was appointed a full-time Member of the Railway Executive, of which he became the Deputy Chairman in 1948. In the same year he was elected a Member of the Institute of Transport, and was also among the Members of the National Advisory Council for Industry & Commerce appointed by the Ministry of Education. In November, 1948, he resigned his Deputy Chairmanship of the Railway Executive in order to assume his new appointment as Chief of the Imperial General Staff. In 1952 he was appointed Governor-General of Australia, and during his term of office he transferred his membership of the Institute of Transport to its New South Wales Section. Field-Marshal Sir William Slim retired from the office of Governor-General of Australia in January last.

Lord Stonham has become Chairman of the Road & Rail Association.

Mr. S. S. Ramasubban has been appointed General Manager, Western Railway of India.

Mr. M. C. B. Johns, Works & General Assistant to the District Engineer, Crewe, has been appointed Assistant District Engineer, Manchester.

Addition to Birthday Honours List: Mr. H. A. Butler—at one time Divisional Stores Superintendent, Southern & North Eastern Areas, former L.N.E.R., has been appointed C.B.E.

The following changes have been announced in the composition of the Rhodesia Railways Board: Mr. T. H. Grey, Vice-Chairman appointed Chairman; Mr. W. T. Masterton appointed Executive Vice-Chairman. Editorial reference to these appointments is made elsewhere in this issue.

with Messrs. Chalmers, Wade & Company, Chartered Accountants of Liverpool and London. In June, 1932, he joined the staff of British Insulated Cables as its first Accountant, and was promoted to be Financial Secretary in 1937. Five years later he was appointed Executive Manager (Finance), and in 1945, following the merger of the British Insulated and Callender Cable Companies to form the new British Insulated Callender's Cables Limited, he was elected to the Board of Directors. In 1947 he was appointed Deputy Chairman, B.I.C.C., and three years later became Chief Executive of the Company. On the retirement of Sir Alexander Roger in 1954, Mr. McFadzean became Chairman, and combines with this the office of Managing Director. In addition to his responsibility with B.I.C.C., Mr. McFadzean is Chairman, British Copper Refiners Limited, British Insulated Callender's Construction Co. Ltd., of which he is also Managing Director, and of British Insulated Callender's (Submarine Cables) Limited. He is also a Member of the



Mr. S. C. Webb

Appointed Traffic Manager, Doncaster, Eastern Region

Royal Institute of International Affairs, a Fellow of the Royal Horticultural Society, a Member of the Council of the Institute of Directors, and a Member of the Ministry of Labour Advisory Board on the Resettlement of Ex-Regulars. When the President of the Board of Trade announced the formation of an Advisory Council on Middle East Trade in 1958, Mr. McFadzean agreed to be Vice-Chairman and Industrial Leader of the Council, but, at his own request, he retired temporarily from this post in February, 1959. In September, 1958, Mr. McFadzean was elected Deputy President and President Elect of the Federation of British Industries, becoming President in April, 1959, and later that year, he was appointed Director of the Midland Bank Limited, and the Midland Bank Executor & Trustee Company Limited.

Mr. S. C. Webb, District Commercial Officer, Doncaster, Eastern Region, British Railway, who, as recorded in our May 27 issue, has been appointed Traffic Manager, Doncaster, is 54 years of age. He joined former Great Northern Railway in 1921, being appointed an L.N.E.R. Traffic Apprentice nine years later. After a period of training in the North Eastern Area, he held various positions in West Hartlepool, Hull, Newcastle and York. In 1946 he became Goods Agent, Wellington Street, Leeds, the following year being appointed Assistant District Goods & Passenger Manager, Lincoln. Mr. Webb was promoted to be District Commercial Manager, Cambridge, in 1955, and District Commercial Officer, Doncaster, in 1957. In his new position, Mr. Webb will be responsible for the Commercial, Operating and Motive Power activities in the Doncaster, Scunthorpe, Brigg, Gainsborough, Retford, Worksop and Newark areas.

We regret to record the death of Mr. H. W. T. Young, District Traffic Superintendent, Chester, London Midland Region.

Dr. J. H. Mitchell, Director of research of Ericsson Telephones Limited, has been appointed to succeed Mr. G. D. Christie as Chairman, Associated Transistors Limited. Mr. Christie, who is a Director of Automatic Telephones & Electric Co. Ltd., remains a member of the Board of Associated Transistors Limited.

THE INSTITUTE OF TRANSPORT
METROPOLITAN SECTION
The following Officers and Committee have been elected to the Metropolitan Section of the Institute of Transport:—

Chairman:

Mr. S. G. Hearn.

Immediate Past-Chairman:

Mr. C. F. Klapper, "Modern Transport."

Vice-Chairmen:

Mr. F. D. M. Harding, Pullman Car Co. Ltd.; Mr. R. M. Robbins, London Transport; Mr. F. J. Speight, George Ewer & Co. Ltd.

Honorary Treasurer:

Mr. A. R. Parselle, Ministry of Food.

Honorary Secretary:

Mr. E. O. Morris, Pullman Car Co. Ltd.

Committee:

Mr. P. A. White, British Railways, Southern Region; Mr. L. W. Cox, B.R., London Midland Region; Mr. G. J. Dickens, London Transport; Mr. A. F. Walton, British Road Services; Mr. G. F. Fiennes, B.R., Eastern Region; Mr. A. J. Hailstone, General Steam Navigation Co. Ltd.; Mr. J. F. Parke, "Modern Transport"; Mr. G. F. Page, J. Lyons & Co. Ltd.; Mr. C. O. Potter, Pease Transport Ltd.; Mr. J. W. Dedman, B.R., Eastern Region; Mr. R. C. Hider, London Transport; Mr. E. G. Whitaker, Unilever Limited; Mr. W. M. Dravers, B.E.T. Co. Ltd.; Mr. M. R. Haddock, National Dock Labour Board; Mr. J. McMullen, I.C.I. Limited; Mr. C. F. King, Bryant & May Ltd.; Mr. Alex J. Webb, London Transport; Mr. J. W. Bannard, Unilever Limited; Mr. R. L. Charlesworth, B.R., Western Region.

Mr. J. M. Fleming, Traffic Manager, East Coast Division, Scottish Region, has been elected Chairman, Scottish Section, Institute of Transport. The Vice-Chairmen are Mr. J. P. Young, Mr. J. R. Proudfoot, and Mr. R. MacKenzie.

Mr. A. F. R. Carling has been re-elected Chairman of the Council of the Public Transport Association. The Vice-Chairmen are Mr. R. J. Ellery, re-elected for a second year, and Mr. F. W. Hodgkinson, elected to fill the vacancy created by the retirement of Mr. R. E. Chisnell.

Mr. E. J. Pickett has been appointed Principal Executive Assistant, Office of the New Works Engineer, London Transport Executive.

Mr. S. Ferry, Traffic Manager, Trent Motor Traction Co. Ltd., will be retiring from the service on September 30.

Mr. Tom C. Firth has been elected Chairman of Brightside Engineering Holdings. He replaces Mr. Ambrose Firth who has resigned.

Mr. R. A. Moir, a Director of Standard Telephones and Cables, Limited, has been elected Chairman of the Telecommunication Engineering & Manufacturing Association, and Mr. W. F. Oakley, a Director of the Automatic Telephone & Electric Co., Ltd., was elected Vice-Chairman.

Mr. A. C. Main, of Associated Electrical Industries (Manchester), has been re-elected Chairman of the Committee of British Employers Operating Abroad. Mr. R. E. Leapingwell, a Director of Aiton & Company has been re-elected Vice-Chairman. Mr. P. Archer, of Simon-Carves, has been elected Treasurer in succession to Mr. Arthur Baker of the Bowater Paper Corporation. Mr. D. A. Patterson, of J. and E. Hall, and Mr. E. J. H. Barker, of the Bowater Paper Corporation, have been elected to the Executive Committee.



Mr. C. L. Parkinson

Appointed District Engineer, Lancaster, London Midland Region

Mr. Clifford L. Parkinson, Assistant District Engineer, Newcastle, North Eastern Region British Railways, who, as recorded in our May 5 issue, has been appointed District Engineer, Lancaster, London Midland Region, began his railway career with the London Midland & Scottish Railway at Euston in 1931. After training in the Chief Civil Engineer's Office and in the office of the District Engineer, London, he gained experience as Assistant Resident Engineer in Manchester, London and Birmingham. He was then appointed Resident Engineer, Birmingham in 1945. He transferred to the Permanent Way Office, Euston, in 1949, and a year later became a member of the Committee appointed by the Civil Engineer's Committee to consider relaying methods and costs on all Regions. He was appointed Assistant District Engineer, Barrow-in-Furness in 1952, and held a similar appointment at Darlington, 1953. He became Assistant District Engineer, Newcastle, in 1957.

Sir Walter Worboys has been elected Chairman, British Thermoplastics & Rubber Industries Limited in place of Sir Graham Hayman.

Mr. W. E. A. Redfearn has resigned from the Chairmanship of the Alloy Steels Association and is succeeded by Mr. R. Bavister.

In association with the Catenian Association, a Mass of Requiem is to be offered for Mr. S. B. Taylor, late Chief Secretary, British Transport Commission, at the Church of the Immaculate Conception, Farm St., Mayfair.

We regret to record the death of Mr. D. Bruce, formerly Managing Director, British Polar Engines Limited, and lately Deputy Chairman, Associated British Engineering Group.

We regret to record the death of Mr. F. C. Archer, Superintendent, Winding Department, Witton Engineering Works, General Electric Co. Ltd., who was responsible for the introduction of many new features in the winding and manufacture of electrical machines. He played an important part in the application of direct-cooled windings for large alternator rotors and stators and, in the field of traction, worked jointly with the late Mr. G. H. Fletcher to produce the Fletcher-Archer armature coil.

NEW EQUIPMENT AND PROCESSES



Mobility for Heavy Plant

VULCA-SKATE machine-removal bogies enable heavy production machinery to be interchanged or removed to new premises in a factory area without using lifting tackle. When used in conjunction with Vulcascot level-mounts only two spanners are required and often one man can move substantial lathes and other machine tools over level floors.

Each bogie consists of a substantial triangular-shaped casting on three double-wheel ball-bearing castors. The safe load capacity is 1½-tons so that a 6-ton machine on four mounting points can be handled. A cut-out is designed to accommodate standard sizes of nut used with Vulcascot level mounts; interchangeable inserts fit the slot for this purpose.

In practice it is only necessary to raise the machine to give a clearance of 3-in. above floor level by turning the levelling screws clockwise, roll the set of Vulca-Skates into position so that they engage with the levelling-screw nuts below the mounting feet, and then to lower the machine on to the bogies by turning the screws anti-clockwise.

The wheels of the bogie are positioned sufficiently far apart to enable the largest size of level-mount plate to be removed without difficulty from beneath the bogie and eventually placed in the new location ready for lowering the machine again.

Further details may be obtained from the manufacturer, Vulcascot (Great Britain) Limited, 87/89 Abbey Road, London, N.W.8.

Prefabricated Catering Unit

THE Little Chef is a completely self-contained catering unit. It is built on a heavy steel chassis and consists of a completely prefabricated permanent building of steel and aluminium, containing modern stainless-steel kitchen, catering and snack bar equipment. It also includes toilet and washroom facilities.

Being a prefabricated building the unit can be moved to a prepared site (concrete foundation with drainage and main services already provided), and in a matter of hours be off loaded, connected up, and in full operation.

The 11-plus stool unit can be satisfactorily staffed by one or two persons, depending on the site, because the kitchen equipment is planned to provide efficient and speedy service with the minimum of movement in fulfilling the customers' orders. A wide

variation of menu is obtainable, including all types of grills, freshly fried potatoes, toasted or plain sandwiches, hot and cold beverages, cold meats, salad dishes, and so on. All food storage is refrigerated, including the sandwich display unit.

The Little Chef is designed to cope with summer and winter temperatures with heating and cooling facilities. A serve-out window is provided for motorists or customers who do not wish to avail themselves of the seating facilities.

The initial units will be operated by Little Chef Limited for Diners Limited, both Lockhart Group companies. Diners Limited, however, welcome inquiries from substantial and proficient caterers who may wish to operate one or more units on the understanding that these will conform in every respect in regard to menus, prices, presentation, hygiene, and rules maintained and directed by Diners Limited.

Further details can be obtained from Diners Limited, 5, Tilney Street, Park Lane, London, W.1.

Pedestal Welders

TWO new pedestal welders are illustrated on this page. The first, the foot-operated M. 304, is of robust design and very accurately controlled by process timing. It is extremely simple to set up and capable of welding mild steel plate up to 8 S.W.G. + 8 S.W.G. and non-ferrous metals up to 18+ 18 S.W.G.

The illustration on the right shows the D.P. 60 air-operated weld/press unit. This machine, which can handle the same materials as can the M. 304, comprises a tapped welding transformer complete with four-stage air cylinders, electrically-operated valves, and secondary jumpers. Operating on the series-welding principle, the pitch adjustment on each unit is from 1 in. up to 4½ in. One or several of these units can be

controlled by one control panel and energised simultaneously or in cascade with a "customer choice" of condenser-charging timing and ignitron contactor, or completely electronically controlled.

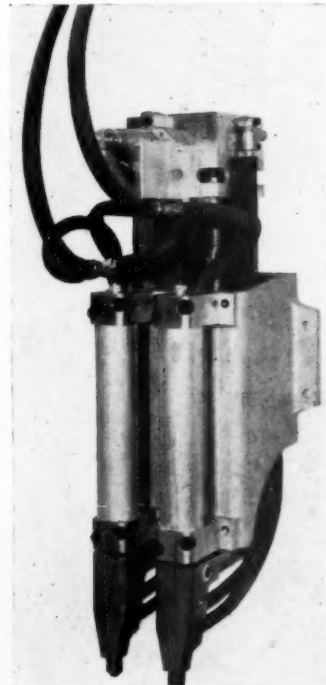
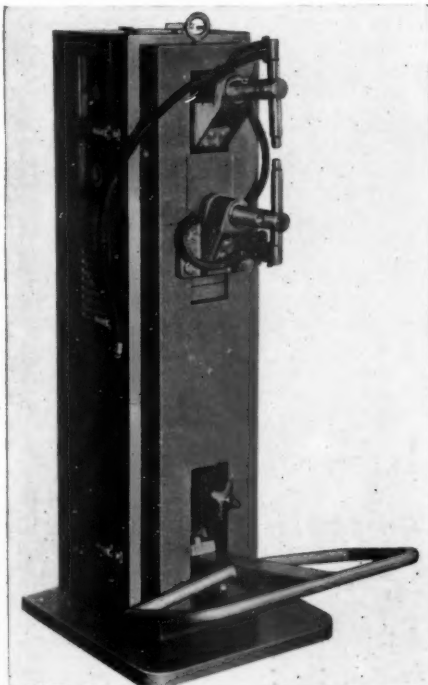
Further details can be obtained from the manufacturer, the Aro Machinery Co. Ltd., 190, Castelnau, S.W.13.

Portable Measuring Instrument

THE Elcotector Mark II is a fully-portable instrument designed to carry out a wide variety of measurements in a non-destructive manner anywhere in factory or field. Battery-operated, it entirely eliminates the need for mains supply points.



For certain production requirements, an industrial version of this instrument, housed in a steel lock-up wall-fixing cabinet, is available. When fitted with the requisite relays, it can give audible or visible warning of sub-standard production; it can even shut down machines, or carry out any other similar function to avoid damage to plant or the



production of unsatisfactory components.

The machine's primary use is for all types of coating measurements on components. It can also measure the thicknesses of most metallic and non-metallic foils both in the static and moving state and can therefore be applied to a production run to give continuous readings of thickness, hardness, or other changes as material is produced. Other duties include surface crack detection, the comparison of hardness of steel components, and the variation between different types of alloys.

As the unit has printed circuit and is fully transistorised, weight and bulk are reduced to a minimum. Dimensions are about 8 in. x 6 in. x 4 in., and weight with batteries, lead, and probe is 7 lb. 13 oz.; complete with case 11 lb. 10 oz.

Power is provided by ten Drydex T15 or Ever Ready U.11 dry batteries giving an average life of 200 hr. at about 6 hr. a day, or four hours at the cost of one penny. A mains power unit can be incorporated.

Panel mountings comprise a moving coil meter which may be positioned for easy viewing, 10-turn helical potentiometer, change-over switch, sensitivity control, battery voltage test button, double-pole on/off switch, and bayonet-type co-axial socket for probe lead. One probe, pencil or extended type, is supplied with the unit.

Further details can be obtained from the manufacturer, the East Lancashire Chemical Co. Ltd., Fairfield, Manchester.

Welding Meter

A METER for a.c. welding production, research, and development has been designed to measure the electrical conditions in a welding arc. It can be applied in costing, calculating efficiency, developing electrodes, and improving production techniques—e.g., in determining the ideal cooling rate for various metals.

The unit consists of a watt-hour meter, ammeter, voltmeter, and protective relay all housed in a compact case (16½ in. x 5½ in. x 6½ in.), suitable for switchboard or wall mounting. The user can thus see at a glance the arc voltage and current and the total energy being consumed.

The relay gives protection against over-current in the event of the meter being used with an incorrect current transformer ratio. A four-range current transformer for stepping down the current from 100, 300, 500, or 1,000 A. to 5 A. can also be supplied. This gives a wide variation on the welding currents that can be accurately recorded.

The meter is also suitable for other manu-

facturing processes where energy consumption over short periods has to be measured.

Further details can be obtained from the English Electric Co. Ltd., Marconi House, Strand, London, W.C.2.

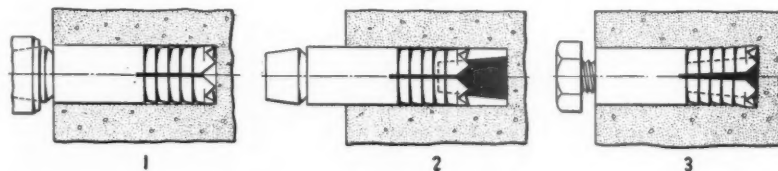
Concrete Anchor System

THE Phillips Red-Head permanent concrete anchor system for fixing anything from shelving to heavy plant requires little effort and no special skill to use.

A self-drilling hollow-core steel expansion shell quickly cuts its own close-fitting hole into concrete by being rotated while hammered either by hand (light rapid blows) or with any make of air or electric percussive hammer. In both cases a chuck head is



needed to guide the shell during insertion and this may be rotated by means of the handle shown to the left in the illustration or by a concentrically mounted hand holder/driver. The handle is primarily for use when the chuck shank shown on extreme right is fitted for the engagement of a percussive hammer.



Drilling is continued until the chuck becomes flush with the concrete surface when the shell is withdrawn and a red-coloured steel taper plug is inserted in the hollow drilling end. By means of a few additional hammer blows after re-insertion in the hole the shell is split along pre-formed

grooves and undercuts the bottom of the hole. It is then only necessary to give the chuck a sharp sideways blow to remove the tapered portion of the shell protruding from the concrete surface. The main portion which is now firmly embedded carries a class 2 Whitworth or U.S. internal thread for a setscrew or stud. Bolt sizes range from ¼ in. to ¾ in. An alternative arrangement is to have a threaded stud integral with the taper plug.

The accompanying drawing shows:—

1. Completion of drilling the hole
2. Taper plug positioned in shell before expanding
3. The shell firmly secured with load-bearing setscrew placed in position.

Further details may be obtained from Mr. H. W. McMullan, 10, Union Court, Old Broad Street, London, E.C.2, who is British Manager for the manufacturer, Phillips Drill Company, Michigan City, Indiana, U.S.A.

Two-Way Radio

THE G.E. 25-W. two-way radio unit, designed for railway communication and built to specifications of the Association of American Railroads (AAR) for rugged operation aboard locomotives and guards' vans, is suited for both industrial sidings and long-distance lines.

The radio can be operated on 60 cycles, 117V. a.c. or on 12 or 64V. d.c. through a rotary converter. It is provided with 8W. audio power which produces sufficient amplification to overcome noise in the cab.

The new G.E. package includes a standard mounting base, baseplate, plug, cable and terminal, and a two-frequency control box. Four-frequency equipment is available.

Further details may be obtained from the

International General Electric Company, 150, East 42nd Street, New York 17, New York, U.S.A.

Catalytic Heating

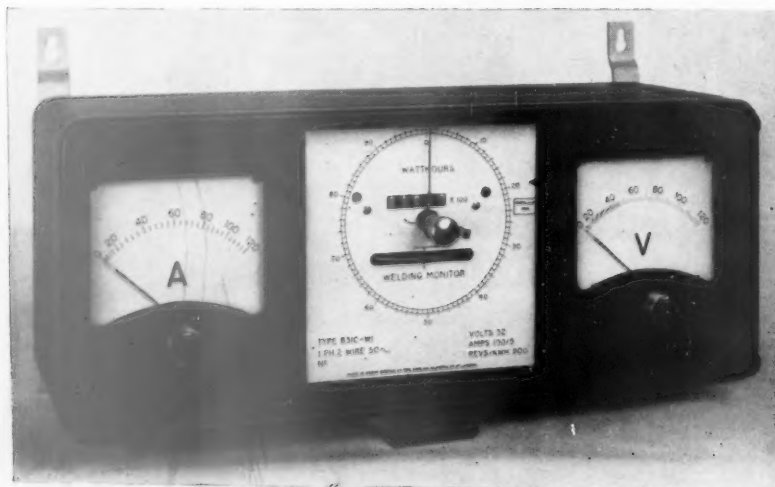
HEATER panels which use gas from either town mains or bottled supplies to combine with oxygen in the air in the presence of a catalyst should have many domestic and industrial applications. As a pure gas will oxidise completely to CO₂ and water no flue is needed.

The same amount of heat is generated as when burning the gas in the conventional way but a panel of asbestos sponge used to contain the catalyst never reaches ignition point and no incandescence results. The panel is protected by a grille.

Pre-heating of the panel usually is by a built in electrical resistance element. The gas distributed in the sponge oxidises at about 300–330° C., so raising the temperature in front of the appliance by the combined effects of convection and infra-red radiation. Automatic temperature control devices can be incorporated.

Panels of various sizes and shapes can be produced and assembled to form heat canopies, tunnels, and so on.

Further details may be obtained from the manufacturer, Cranmer & Marden Limited, 14, Bow Lane, London, E.C.4.



East Coast Main Line Widening

Construction of additional line between Pilmoor and Alne Stations

The widening of the East Coast Main Line North of York by the construction of an additional line between Pilmoor and Alne Stations, one of the most important track improvement schemes so far undertaken by the North Eastern Region of British Railways, was completed on June 19.

Provision of this new section of line means that throughout the 30 miles between Northallerton and York (Skelton) there will be two lines in each direction. This eliminates the former bottleneck between Pilmoor and Alne where one southbound line was required to carry an average of 130 trains a day ranging from high-speed East Coast expresses to heavy freight and mineral trains.

Improved Train Timings

The new five mile section of line joins the duplicate southbound line which previously terminated at Pilmoor and commenced at Alne. In addition to easing the problem of traffic working, it will be possible to schedule more advantageous freight train timings. In this connection the majority of the trains from Tees-side and the North which have hitherto had to be routed via the Leeds Northern line (Ripon, Harrogate and Wetherby) are being diverted to travel over the main line via York. This avoids the necessity to provide assisting engines on the Leeds Northern route and will result in faster transit times and the more efficient and economical use of engines and train crews.

To accommodate the new line it has been necessary to carry out considerable widening of track formation and bridges. In all, five road bridges and three rail bridges have been reconstructed, major work being done during week-ends to keep interference with main line trains to a minimum.

Long-welded Rails

Long-welded rails have been installed in the new track and for comparative purpose two different rail welding practices have been adopted. One section of the line about two miles long consists of 300-ft. long flash-butt welded rails which have been fishplated together. The remaining portion of approximately three miles consists of 60-ft. lengths of rail site welded by the "quick thermit" welding process into continuous lengths. The relative performance of the two different practices will be checked under intensive traffic conditions. Adjustment switches to take up end rail movement of the long welded and continuous welded rails have been sited approximately $\frac{1}{4}$ mile apart at the colour-light signals.

Signalling Improvements

Various signalling improvements associated with the scheme have been carried out. The up and down goods lines between Thirsk and Pilmoor have recently been equipped with automatic colour-light signals and the new line between Pilmoor and Alne has been similarly equipped giving complete colour-light signalling and track circuiting on all four lines between York and Northallerton.

The Automatic Warning System is an integral part of the new signalling. The junction at Pilmoor has been remodelled permitting trains to be diverted from one line to another at speeds of up to 50 m.p.h. At the same time opportunity has been taken to remove the Pilmoor signalbox lever frame and substitute a power signalling installation from which the signals and points are electrically controlled. The signalbox structure has been enlarged to accommodate the additional signalling equipment.

The track layout diagram is fitted with light

indications so that the signalman can follow traffic movements over a distance of some six miles in each direction, the trains leaving Thirsk for York and Tollerton for the North being immediately indicated. In the event of a train being detained at a signal, the driver can communicate with the signalman by telephone and receive instruction.

At Tollerton a new signalbox is being built and equipped with signalling apparatus similar to that at Pilmoor. This re-signalling work will enable Pilmoor North, Sessay, Alne, Sunbeck and Raskelf signalboxes to be closed.

The signalling cables and associated equipment along the widened section of line have been renewed and a new method of laying has been adopted whereby the cables which formerly were underground are now laid in 30 ft. lengths of pre-stressed concrete surface troughing.

Pre-fabricated Building for Car Carrier Service

Only one week was required to erect the pre-fabricated timber building shown in the illustration, the reporting centre for the British Railways, Eastern Region, day service for accompanied motorcars between London, Newcastle, and Edinburgh. Situated at the Holloway, London, terminus of the "Anglo-Scottish Car Carrier," the accommodation includes a waiting room with reception desk, public telephone and toilet facilities.

Possibility of Re-erection

The structure was made from factory-made timber units designed on an 8-ft. module. This method was chosen as it not only accelerated the assembly but has enabled the building to retain 100 per cent recovery value should it be necessary to re-erect it elsewhere.

The waiting room furniture is covered in dark green upholstery, the floor with iris green lino; the walls are pale grey.

The seven days it took to erect the building on site included the installation of heating, electrical and plumbing services.

Since the "Anglo-Scottish Car Carrier"

Tunnel Maintenance Platform, B. & O. RR.

Maintenance of an aggregate length of 23 miles of tunnel having natural rock, timber, brick or concrete lining is an important item of expenditure on the Baltimore & Ohio Railroad. Nearly all repairs and other internal works have to be carried out under traffic, some of which is heavy.

They have long been executed with the aid of frame scaffolding mounted on push trolleys, but this equipment provided inadequate working space and necessitated the erection of subsidiary scaffolding that had to be hung from the tunnel walls and removed for the passage of trains. Consequently the B. & O. RR. engineers in collaboration with those of Athey Products Inc., recently designed a self-propelled portable scaffold.

This is mounted on rubber-tyre wheels straddling the rails but has also small flanged grinding wheels running on them. As it can run either on or off the track at speeds up to 15 m.p.h. forward or reverse, the vehicle is handy in carrying men and machines to the work site and in clearing the line rapidly.

Adjustable Side Platforms

The central main working platform is 14 ft. long and 8 ft. wide, but from it adjustable side platforms can be extended on both sides to a width of 5 ft., providing an overall working width of 18 ft. These side platforms are in three sections and are raised, lowered, extended and withdrawn by a system of cables, and can be used singly, two, or all three together, at whatever height they are needed.

The main platform with its extensions is raised and lowered by hydraulic rams; normally, when lowered it is about 10 ft. 6 in. above rail level, but it can be raised through a further height of up to 3 ft. 6 in., giving a working platform 14 ft. above the rails. Rigid support for it when work is proceeding is obtained by lowering stabilising jacks at the four corners of the chassis on to the track.



Pre-fabricated timber waiting room at Holloway Loading Depot for "Anglo-Scottish Car Carrier" service

Inverness—Aberdeen in Two-and-a-half Hours

Experimental service of inter-city diesel trains to begin on July 1

The Scottish Area Board of the British Transport Commission announced last week at a special meeting in Aberdeen that British Railways, Scottish Region, would introduce an inter-city diesel service between Aberdeen and Inverness on July 1, to run until the end of the summer timetable.

The object is to test the demand for a high-speed service between these two cities. Two new trains in each direction will connect the two cities in 2½ hr., giving a service never before provided. They will call at Nairn, Forbes, Elgin, and Keith Junction, and open up excursion facilities for tourists and holidaymakers in the area.

Cheap day fares are available on these trains every day of the week. A "mini-buffet" in each train will serve light refreshments.

Fast Schedules

The morning trains will leave Inverness at 8.30 a.m. and Aberdeen at 8.45 a.m., and the evening trains will leave Inverness at 5.15 p.m. and Aberdeen at 5.30 p.m. Visitors to each city will be able to enjoy a full day without starting too early in the morning or getting back too late at night.

Intermediate towns on the route will also benefit. Visitors from Nairn will get to Inverness in 25 min. or Aberdeen in 130 min.; from Forbes to Inverness in 40 min. or Aberdeen in 115 min.; from Elgin to Inverness in 58 min. or Aberdeen in 98 min.; from Keith to Inverness in 81 min. or Aberdeen in 70 min.

The Scottish Area Board states that it is anxious to expand diesel services wherever possible. This new development follows closely on the recently introduced express diesel-hauled trains between Edinburgh and Aberdeen. If successful, it will be re-introduced next year.

The service will be operated by three-car diesel multiple units seating 18 first class and 144 second class passengers with observation ends enabling a full view of the delightful country on this route.

Colonel Donald H. Cameron of Lochiel, Chairman of the Board, in his address stated:

"It is a great encouragement to railwaymen to be able to introduce modern equipment in this part of the world. I will not disguise from you the fact that we need far more patronage than we are getting today. This applies both to freight and to passenger. I believe that we are providing the sort of service that you require on a more and more reliable and businesslike basis. Since the introduction of the 'Blue Spot' fish specials, I am pleased to say that there has been a marked improvement in transit and I hope that no outside influences will harm the prosperity of your great fishing industry."

Railways, he added, were very much in competition with all forms of transport, both publicly and privately owned, and the best way of getting the sort of railway that the public required, especially in that part of Scotland, was to use it. If the railways were not used, all sorts of economic questions would begin to arise. In Aberdeen, where there was such a strong sense of business acumen and drive, he could not do better than repeat what his predecessor had said on a similar occasion: "For goodness sake, use us and criticise us; don't neglect us and criticise us!"

British Railways Plans for Diesel Services

Besides the "Midland Pullman" de-luxe (first class only) multiple-unit diesel trains between St. Pancras and Leicester and Manchester to be placed in service by the London Midland Region, British Railways, on July 4, and the Western Region diesel Pullman trains (including second class) to run, at a later date, in the Western Region between Paddington and Birmingham and Wolverhampton, and the forthcoming Scottish Region Inverness—Aberdeen service mentioned elsewhere in this issue, the following are routes on which it is hoped to introduce diesel trains in the near future:—

London Midland Region: Manchester Cen-

tral—Liverpool Central (express service); Birkenhead Woodside—Helsby—Chester; Marylebone—Aylesbury; Marylebone—High Wycombe; Manchester Victoria—Wigan—Southport; Manchester Victoria—Wigan—Liverpool Exchange; Rochdale—Wigan; Rochdale—Southport; Rochdale—Liverpool; Bolton—Wigan—Liverpool; Manchester Central—Northwich—Chester Northgate;

London Midland Region and N.E. Region: Hull—Leeds—Huddersfield—Manchester—Liverpool ("inter-city" using specially constructed stock); Leeds—Bradford—Halifax—Rochdale—Manchester—Wigan—Liverpool; York—Wakefield—Rochdale—Manchester; Bradford—Halifax—Burnley—Blackburn—Preston—Blackpool;

Southern Region: Extension of existing Southampton Terminus—Winchester City service to Reading General to connect with Western Region diesel services; and London—Sanderstead—Oxted—Edenbridge—East Grinstead—Tunbridge Wells;

Western Region: Paddington—Slough—Reading and Paddington—Reading—Didcot—Oxford (some diesel multiple-unit services already operating and will be gradually extended as further vehicles are received from the builders); Taunton—Exeter—Plymouth; Newton Abbot—Kingswear; Plymouth—Penzance; Truro—Falmouth; Wellington—Chester; Shrewsbury—Welshpool—Aberystwyth; Dovey Junction—Barmouth—Pwllheli; Ruabon—Dolgelley—Barmouth; Shrewsbury—Swansea Victoria; Whitchurch—Oswestry—Welshpool.

Staff and Labour Matters

C. S. & E. U. Conference

One important item which will be discussed at the Confederation of Shipbuilding & Engineering Unions annual conference which opened at Llandudno this week will be a composite motion which has the backing of most of the big unions affiliated to the confederation instructing the executive council to make an immediate application for a general wage increase. The last general increase in the engineering industry was in October, 1958.

The C.S. & E.U. is represented on the Railway Shopmen's National Council with the N.U.R. Railway shopmen received a 5 per cent increase from January 11, 1960, but they are not covered by the Guillebaud Report which was confined to railway salaried and conciliation staff who are embraced in separate negotiating machinery from that for railway workshop staff.

Guillebaud Report

There is evidence of some restlessness among members of the A.S.L.E. & F. at the delay in implementing the pay increases arising from the Guillebaud Report. On June 19, the Willesden branch of the A.S.L.E. & F. passed a resolution urging the society's executive committee to take strike action from midnight on Friday/Saturday, July 1/2.

The outstanding points still to be settled between the British Transport Commission and the trade unions are the increases to be granted to railway-owned dock staff, that is those employed at the packet ports and the question of the operative date of the revised rates of pay for salaried and conciliation staff in general.

The Willesden branch of the A.S.L.E. & F. have made it clear that its members will refuse to accept any settlement that is not back-dated to January 11, 1960, which was the operative date of the 5 per cent interim increase granted to the staff covered by the Guillebaud Report.

The Re-constituted Rhodesia Railways Board



Seated on the left is Mr. T. H. Grey, Chairman. Standing are Messrs. J. C. Haskins and A. D. McLean; Lt.-Colonel H. B. Everard; Messrs. L. S. Davies, W. T. Masterson, and J. Thompson. The General Manager, Rhodesia Railways, Mr. J. W. S. Pegrum, is seated on the right (see editorial on page 729)

Contracts and Tenders

L.T.E. orders for Metropolitan Line stock

The London Transport Executive has placed an order with Cravens Limited for 27 trains with unpainted aluminium alloy bodies for the complete replacement of existing rolling stock on the Uxbridge service of the Metropolitan Line. The 216 cars which make up the new trains, will give much more accommodation on the line, especially in rush hours. Each car will have over 30 per cent more seats and all trains in the peak periods will be of eight-car length. At present over a third of the Uxbridge trains have only six cars. The value of the contract is some £4,000,000.

A further contract for the supply and installation of overhead equipment for 25-kV. 50-cycle a.c. railway electrification has been awarded to the British Insulated Callender's Cables Group by the Indian Railway Board. This job is valued at £1,200,000 and covers some 300 track miles of the Eastern Railways system. The route to be equipped is on the main line from Delhi to Calcutta and lies between Gaya and Moghalsarai. It forms part of the second phase of the Indian Railway Board electrification programme and is to be ready for use by July, 1961. The equipment will be similar to that at present being installed by the B.I.C.C. Group for the South Eastern Railway, the order for which was announced in December, 1958.

The New Zealand Government Railways has placed a contract with British United Traction Limited for the supply of 44 vertical diesel engines for installation in diesel-electric locomotives which are to be built in the Government Railways workshops. Twenty twin-engined locomotives will be erected, 10 at the Hillside Workshops, Dunedin, and 10 at Addington Workshops, Christchurch. Each locomotive will be powered by a pair of 210-b.h.p. B.U.T. diesels while the electrical equipment will be supplied by A.E.I. Limited. In addition, four spare engines and generators are to be delivered under this contract. The new shunters will be placed in service at marshalling yards both in the North and South Islands.

Fawcett Preston & Co. Ltd., a member of the Metal Industries Group, has secured an order from the Brush Electrical Engineering Co. Ltd., for over 100 sets of locomotive resistors. They will be fitted to diesel-electric locomotives which Brush is building for British Railways. Each set weighs about 6½ cwt. The order will be completed by October this year.

British Railways, Eastern Region, has placed the following contracts :—

International Computers & Tabulators Limited : supply, installation and maintenance of one type 1301 computer with magnetic drum, card feed, line printer, output punch, and 400 words of immediate access store for Machine Accounting Centre, Regional Accountant's Department, Peterborough

Wellerman Bros. Ltd. : cleaning and mechanical pointing of the linings of Gasworks Tunnel and Copenhagen Tunnel (Up Fast and Up Slow lines), between Kings Cross and Finsbury Park

Kennion, Irvine & Co. Ltd. : supply and delivery of "Arki-Endon" track-laying cranes and associated equipment

Carter-Horseley (Engineers) Limited : repairs to main girders and flooring of

underbridge No. 1,837 between Whittlesea and Peterborough East

W. Malthouse Limited : provision of new staff accommodation building in Nos. 9 and 10 carriage sidings and Nunery carriage sidings at Sheffield Victoria

Tarslag Limited : resurfacing of roadways in the Sheffield District

James Kilpatrick & Son Ltd. : supply, delivery and erection of electrical installation, m.v. distribution, fuelling installation, control wiring for washer, and so on, at Billet Sidings, Stratford, E.15

Matisa Equipment Limited : supply and delivery of two Matisa ballast cleaning machines and associated equipment.

Mitchell Engineering Limited : repairs to mechanical coaling plant at Peterborough, New England

Constable, Hart & Co. Ltd. : resurfacing of roadways in the Kings Cross and Stratford Districts

Pavior Construction Co. Ltd. : resurfacing of roadways in the Peterborough and Doncaster Districts

Roadworks (1952) Limited : resurfacing of roadways in the Ipswich District

R. Ridd & Son (Contractors) Ltd. : cleaning and painting of stations, buildings, and structures between Cleethorpes Station and Marsh Junction, Holme Street Junction and Goods Junction, Bethnal Green Junction and Hackney Downs (London end), and Hackney Downs (country end) and Phillip Lane Bridge No. 1936

Crompton Parkinson Limited : supply, delivery and installation of e.h.v. and m.v. switchgear and cables, transformers and rectifier at Doncaster Wagon Works

Grant, Lyon & Co. Ltd. : drainage and blanketing of the formation and the trimming back of the cutting slopes, between Blankney and Nocton.

British Railways, Scottish Region, has placed the following contracts :—

P. Graham & Sons : yard buildings, Perth new marshalling yard

James Scott & Co. (Electrical Engineers) Ltd. : electrical installation, Perth new marshalling yard

Whatlings Limited : piled supports for new underbridge, Kilwinning by-pass road

Hunter & Clark Limited : new station buildings, Carrowhill Halt

Blackburn (Dumbarton) Limited : carriage cleaning facilities, Bridgeton Central

The Scottish Machine Tool Corporation Limited : reconditioning of Loudon wheel lathe, Cowlares Works

R. F. Morrison & Co. Ltd. : suspended ceiling, Queen Street Low Level Station, Glasgow

James Crawford & Sons Ltd. : construction of new signalboxes, Muirhouse Junction and Cathcart

James Young (Contractors) Limited : raising, reconstruction and widening, overbridge No. 1, Eglinton Street Station, Glasgow.

British Railways, Western Region, has placed the following contracts :—

British Insulated Callender's Cables Limited : delivery and installation of high-voltage cables at Bristol

William Cowlin & Son Ltd. : construction of casting shed at Taunton Concrete Works

Grant Lyon & Co. Ltd. : provision of earthworks, permanent way, fencing, and so on, for secondary sorting sidings in

connection with stage IV of the Margam Marshalling Yard scheme, Port Talbot

West's Piling & Construction Co. Ltd. : carrying out piling and the construction of reinforced concrete foundations for the signalbox and amenity blocks at Port Talbot

Fairfield Shipbuilding & Engineering Co. Ltd. : supply of steelwork for the extension to the platform roof at Slough

S. B. Whitehouse : brush painting the goods outwards shed and various offices Hockley Goods Depot, Birmingham

Sid Dagnall & Son Ltd. : supply, installation, testing, connecting, and setting to work of electric lighting facilities at Acocks Green and South Yardley Station.

The Export Services Branch, Board of Trade, has received calls for tenders as follow :—

From Pakistan:

30 broad-gauge diesel-electric locomotives

21 metre-gauge diesel-electric locomotives.

The issuing authority and address to which bids should be sent is the Secretary, Railway Board, Ministry of Railways & Communications, Room No. 342, Tughlaq House, Shahrah Kamal Ataturk, Karachi. The tender No. is PRS-59/Loco/1 & 2/SHPT. The closing date is July 7, 1960. The Board of Trade reference is ESB/16240/60.

From India:

52 wheels sets, broad gauge, 22½-ton axle load, completely assembled for wagon stock, suitable for plain bearings

104 wheel sets, metre gauge, 8-ton axle load, suitable for plain bearings

7,802 wheel sets, broad gauge, 20-ton axle load, completely assembled with solid wheels and axles, 1 m. dia. on tread, suitable for roller bearing axleboxes

3,392 wheel sets, metre gauge, 12-ton axle load, suitable for roller bearing axleboxes.

The issuing authority and address to which bids should be sent is the Director Railway Stores, Railway Board, State Entry, Road, New Delhi 2. The tender No. is GP.22. The closing date is August 12, 1960. The Board of Trade reference is ESB/16210/60.

23,480 roller bearing axleboxes (B.G.) complete with two sets of cylindrical roller bearings and relative fittings inclusive of locking arrangement for 20-ton axle load on rail

1,924 roller bearing axleboxes (B.G.) complete with roller bearings and relative fittings inclusive of locking arrangement with overall dimensions to drg. No. CSW-984, for the 16-ton axle load on rail 6,784 roller bearing axleboxes (M.G.) 3 ft. 3½ in. complete with roller bearings and relative fittings inclusive of locking arrangement with overall dimensions to IRS drg. No. WA 1404, for 12-ton axle load on rail.

The issuing authority and address to which bids should be sent is the Director, Railway Stores, Railway Board, State Entry Road, New Delhi 2. The tender No. is G.P.21. The closing date is August 8, 1960. The Board of Trade reference is ESB/16209/60.

From Greece:

100 85-ton screw couplings.

The issuing authority and address to which bids should be sent is the Hellenic

State Railways (SEK), 12b Polytechniou Street, Athens. The tender No. is 4674. The closing date is July 8, 1960. The Board of Trade reference is ESB/16283/60.

From Lebanon:

Construction of three tunnels on the main Saïda-Beirut Line.

The issuing authority and address to which bids should be sent is L'Office National du Litani, Immeuble Ghannage, Rue Bechara el-Khoury, Beirut, Lebanon. The closing date is June 27, 1960. The Board of Trade reference is ESB/15924/60.

Further details relating to the above tenders together with photo-copies of tender documents, unless otherwise stated, can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).

Notes and News

Closure of Clowne South and Clowne & Barlborough Stations, Eastern Region.—Clowne South Station, Notts., on the Worksop-Mansfield line of the Great Northern Line, Eastern Region, will be closed to all traffic except special excursion trains on July 4, and Clowne & Barlborough, on the same line, will be closed to all traffic except special excursion and seasonal trains. Collection and delivery services for parcels and sundries traffic will continue to be available. Goods traffic in full wagon loads will be dealt with at Elmtun & Cresswell, Whitwell, Spink Hill and Chesterfield Stations.

U.I.C. at Glasgow.—The annual meeting of the Special Committee for the Exchange of Documentation of the International Union of Railways (U.I.C.) was held June 9-10 at Glasgow. Some eight European railway administrations were represented, including the French National Railways, the German Federal Railway, Italian State Railways, Netherlands Railways, Swedish State Railways, Swiss Federal Railways, and British Railways, the chairman administration. Mr. James Ness, General Manager, Scottish

Region, British Railways, welcomed the delegates at the official dinner at St. Enoch Hotel, and the meetings were held in the British Transport Commission Scottish Area Board Room.

Tube Investments Limited Acquisition.—Tube Investments Limited has announced the acquisition of Loewy Engineering Company, a private concern making hydraulic machinery and rolling mill equipment. Terms were not disclosed.

Metropolitan Railway Surplus Lands Co. Ltd.—Sir Bernard Docker, Chairman, Metropolitan Railway Surplus Lands Co. Ltd., in his circulated statement for the year ended March 31, 1960, reports that gross rents at £480,560 showed an increase of £58,944 and net rents were £44,405 up at £356,682. In the final result the gross profit was £433,965 against £342,330 last year, an increase of £91,635 and, after providing for taxation, the net profit was £226,570 a very gratifying increase of £49,306 over the net figure of £177,264 earned in 1958-9. A final dividend of 5 per cent is recommended.

London & Home Counties Electric Traction Society: Electric Rail Tour.—The London & Home Counties Electric Traction Society exists to draw the attention of authorities and the public to the manifold advantages of all forms of electric transport services in preference to others where this is economically practical. With this in mind, it is proposed to organise a series of electric rail tours in the London area, and the first of these, believed to be the first of its kind in the country, will run on Sunday, September 18. Formed by a four-car train of "F" stock, built in 1920 with high-speed motors, the train will leave Wembley Park, L.T.E., at 2 p.m. for Watford Metropolitan, Harrow-on-the-Hill (reverse in G.C. platform), Uxbridge (50 min. break for refreshments), Acton Town, then by fast line to Hammer-smith, Earls Court High Level, High Street Kensington, and Baker Street, so completing circuit of Circle Line, outer rail, finally reversing at Baker Street for a non-stop run to Wembley Park, arriving at 6.43 p.m. Suitable photographic stops will be made.

Tickets are available from Mr. Trinder, 31, Atheldene Road, Earlsfield, S.W.18, price 10s. (children under 14, 5s.), and applications should be accompanied by a postal order.

Further North Eastern Region Posters.—The North Eastern Region, British Railways, has produced two new posters. One, in the historical map series, entitled "Northumberland and Durham," was painted by Mr. E. H. Spencer, F.R.S.A., of Leeds, who has previously designed several attractive posters



The Yorkshire Moors near Ilkley, a new North Eastern Region Poster

for British Railways. The new quad royal poster has as its centre theme a pictorial map of the two counties, flanked on either side by a short descriptive survey. Four columns of small coloured pictures depict principal holiday resorts and landmarks. Historical associations of both counties are illustrated along the base. The poster was printed by Nathaniel Lloyd & Co. Ltd., and lithographed in nine colours. The other poster, reproduced on this page, depicts the Cow and Calf Rocks, Ilkley, in the Yorkshire Moors. It was painted by Mr. G. Russell, R.I., R.O.I., S.M.A., and printed in lithography in six colours by Jordison & Co. Ltd.

Clyde Cruise for Photographers.—Good opportunities for photography and of winning a prize were offered on June 19 by the Caledonian Steam Packet Co. Ltd., the British Transport Commission undertaking, which operates steam services on the Clyde. A trip by mv. *Maid of Cumbrae* afforded a varied choice of scenery, ranging from the Broomielaw and the shipyards and quays of the upper reaches of the Clyde to the lochs and the Kyles of Bute and finally the open firth. Departure was from Bridge Wharf, Glasgow, at 10 a.m., and the cruise ended at Gourock at 8 p.m. with a connecting train due Glasgow Central at 8.50 p.m. A cafeteria service was available on board, also a photographic information bureau where films were on sale. Prizes were awarded for the best black-and-white prints, the best colour print, the best colour transparency and the best 8-mm. colour 50-ft. film.



Some of the U.I.C. Special Committee members meeting in the board room of the British Transport Commission Scottish Area Board

Channel Tunnel Prospects.—Mr. Leo D'Erlanger, Chairman, Channel Tunnel Company, said at the general meeting this week that talks are still going on about the Channel Tunnel project, but it is likely to be at least several months before a firm decision is reached. He stressed that there had to be much discussion by civil servants and others and he could not accurately assess how long this would take.

Welsh Travel Posters.—Rail travel in Wales is featured in the two posters reproduced on this page. That on the left was issued by the Western and London Midland Regions, British Railways, in association with the Welsh Tourist & Holidays Board. The artist is A. Kitson Towler. The poster was printed in seven colours by Waterlow & Sons Ltd.; 2,000 copies are to be used for a two-year display throughout British Railways, and an additional 1,000 copies will be distributed by the Welsh Tourist & Holidays Board. The Rheidol Valley poster was produced by the Public Relations & Publicity Department of the Western Region. Harry Stevens, M.S.I.A., is the artist. Printing in six colours was by the Baynard Press; 1,250 copies will be displayed on British Railways stations during 1960.

Plaque for South African Railways.—A bronze replica of the plaque of Sir Christian Felling, who was General Manager of the Uganda Railways from 1922 until his death in August 1928 (when it was known as the Kenya & Uganda Railways & Harbours), has been sent by the General Manager, East African Railways & Harbours, Sir James Farquharson, to the General Manager of the South African Railways, Mr. D. H. C. du Plessis. It is a gift to the S.A.R. which is celebrating its centenary this month. This

memento has a special significance, for in 1922 Mr. C. L. N. Felling, who was Chief Assistant to the S.A.R. General Manager, was invited by the Kenya Government to undertake the re-organisation of the Uganda Railway. He was knighted in June, 1928. A new plaque was made in the railway



Poster (left) issued by the Western and London Midland Regions in association with the Welsh Tourist & Holidays Board; (right) the Rheidol Valley Line featured in a recent issue by the Western Region

workshops, Nairobi. The original plaque, which is in the Nairobi Railway Headquarters conference room, was made in 1929 by Sir Goscombe John, and was commissioned by members of the staff.

W. H. Allen, Sons & Co. Ltd.—Mr. W. K. G. Allen, Chairman & Managing Director, W. H. Allen, Sons & Co. Ltd., reports in his circulated statement for the year ended December 31, 1959, that despite the slight increase in output during 1959, the profit before taxation was reduced to £904,000 as compared with £1,039,000 for the previous year. This reduction is due partly to a fall of £66,000 in the receipts from royalties and licences to manufacture the company's machinery, which were exceptionally high in 1958.

Extension of the Holiday Season.—The British Travel & Holidays Association held a conference on the extension of the holiday season on June 21 at the National Film Theatre, London. The morning session was presided over by Mr. E. L. Taylor, Chairman of the Holiday Development Committee, and in the afternoon Sir Arthur Morse took the chair. Among the many organisations represented were the British Transport Commission, the British Employers' Confederation, the Associated Examining Board for the General Certificate of Education, and the British Hotels & Restaurants' Association.

Illinois Central Railroad Colour Film.—A new film, "The Railroad Story," has been produced by the Illinois Railroad Association. It portrays the part played by railways in the development of the State of Illinois, and illustrates the function of the railways as employers, buyers of Illinois products, and as major taxpayers. The film also relates the great strides which the railways have made in maintaining modern plant and equipment to meet the need for transport demanded by an expanding economy. Against this background are stated the injustices which exist in the national transport policy of the U.S.A. "The Railroad Story" is a 16-mm. sound-colour film, with a running time of 23 min.



New plaque of Sir Christian Felling being made in the railway workshops, Nairobi

L.T.E. Buses Revert to Normal Route.—The London Transport Executive has stated that when the new access road to the north end of Blackwall Tunnel is opened on June 26, buses and Green Line coaches, which have been diverted for about 18 months while reconstruction work has been in progress, will resume their normal route directly along East India Dock Road.

Waterloo-Portsmouth Service.—Because of lack of adequate patronage, refreshment facilities have been withdrawn from the 4.20, 5.20 and 6.20 p.m. trains from Waterloo to Portsmouth Harbour, British Railways, Southern Region, and the 7.30, 8.20 and 8.43 a.m. trains in the opposite direction. These are rush-hour trains additional to the hourly Waterloo-Portsmouth trains, on which refreshment service is continued without change.

Power Station Equipment Travels by Rail.—A boiler drum weighing 114 tons set out from Renfrew, British Railways, Scottish Region, last Tuesday on a 300-mile rail journey to Derbyshire. It will be installed in an electric power station at Willington. The boiler was loaded at the manufacturers' works on two special wagons each carried on 16 wheels. It is 66 ft. long and 6 ft. 3 in. wide. The special train carrying this load left Renfrew South at 10.30 a.m. on June 21 and arrived at Repton & Willington Station on June 23. The manufacturer was Babcock & Wilcox Limited.

Visit of the Association of Diesel Specialists of U.S.A. to the C.A.V. Limited Works.—A party of officers and members of the Association of Diesel Specialists of U.S.A. recently visited the factories and laboratories of C.A.V. Limited at Acton and Rochester. At Acton the party saw the new engineering centre and part of the electrical equipment factory. At Rochester they toured the production plant to see the manufacture of fuel injection equipment and, particularly, of the "DPA" distributor type fuel injection pump. The visitors expressed great interest in the large amount of development and test work they saw in progress at Acton, and in the large scale production of equipment at both factories.

Work to Start on Stafford By-Pass Road.—Nearly five miles of motorway, with 24 bridges and a three-quarter mile all-purpose road, by-passing Stafford, are to be built in the next 23 months. Mr. Ernest Marples, Minister of Transport, has authorised Staffordshire County Council, as his agents, to accept the John Laing & Son Ltd. tender of £2,680,000 for this and associated works, the second contract in the Stafford By-Pass project. The first contract, let in August last year to J. L. Keir & Co. Ltd. was for the construction of the Creswell Viaduct, about half a mile long, which will carry the motorway over the main Stafford to Crewe railway line and the valley of the river Sow. The viaduct works, now well in hand, were started before the main roadworks so that both should be completed together.

Eastern Region Day Trips to Cambridge and Ely.—Conducted day tours of Cambridge and Ely, arranged by the Eastern Region, British Railways, are now available from London on Wednesdays and Thursdays, until September 29. Both Cambridge and Ely are included in the Thursday tour, for which the fares are 36s. second class, and 42s. first class, with reductions for children. These charges include the return rail journey, London to Cambridge, transport to the city from the station, admission fees to places of interest, lunch and motorcoach trip to Ely and return to Cambridge. Passengers are met at Kings Cross by a guide who escorts

the party throughout the tour. A similar day tour embracing Cambridge only is operated on Wednesdays. Descriptive folders and tickets are obtainable in advance from Kings Cross or Liverpool Street Stations, British Railways town offices, and travel agencies in the London area.

Precision Components (Barnet) Limited, Change of Address.—The new address of Precision Components (Barnet) Limited, makers of Kabi terminal blocks, bench assembly trays, and storage bins, has been changed to Kabi Works, Cranborne Road, Potters Bar, Middlesex.

John Harper & Co. Ltd., Oil-Fired Heaters.—The Radiant oil heater and all other convectors and oil stoves manufactured by John Harper & Co. Ltd., Willenhall, have passed the new exacting safety tests specified by British Standards 3300. The tests were carried out independently at the Ellis Research & Testing Laboratories of Albury, with air velocities ranging from 5 to 26 ft. per sec.

Matchless Machines Limited, Area Distributors.—The TESA Division of Matchless Machines Limited has appointed as area distributors Listers Wholesale (Birmingham) Limited, 143, High Street, Smethwick, Birmingham, and its subsidiary companies. The area covered is Warwickshire, Staffordshire, and Shropshire. Companies in these areas requiring TESA high-precision measuring instruments can now obtain a local service through the new distributors.

Antofagasta (Chili) & Bolivia Railway Co. Ltd.—The Directors of the Antofagasta (Chili) & Bolivia Railway Co. Ltd., have decided to pay, on account of arrears, a dividend of 5 per cent (less income tax) on the 5 per cent cumulative preference stock of the company. The payment will be made on July 30, 1960, to stockholders recorded in the register at 3 p.m. on July 1, 1960. Dividends on this stock will then have been paid up to June 30, 1959.

Forthcoming Meetings

- June 27 (Mon.) to July 1 (Fri.)—Institution of Electrical Engineers. Summer meeting in Scotland.
- July 2 (Sat.)—Permanent Way Institution, London Section. Visit to Royal Albert Bridge, Plymouth. Joint visit with Exeter and West of England Section.
- July 3 (Sun.)—British Railways, Southern Region, Lecture & Debating Society. Visit to Eastleigh Carriage & Wagon Works.
- July 9 (Sat.)—Permanent Way Institution, East Anglia Section. Visit to Port of London Authority.
- July 23 (Sat.)—Permanent Way Institution, London Section. Inspection of L.T.E. new works between Harrow and Rickmansworth.

OFFICIAL NOTICES

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY

APPLICATIONS are invited for appointment as LECTURER in Electric Traction in the Department of Electrical Engineering, to work with a Reader to establish a new section for post-graduate teaching and research in this subject. Salary in range £1,050 x £50—£1,400 x £75—£1,850 plus £60 London Allowance, family allowances and F.S.S.U. membership. Appointment will be in upper range for candidate with appropriate qualifications. Thorough knowledge of machines and rectifiers is of more importance than extensive experience in traction. Applications to Head of Department of Electrical Engineering, Imperial College of Science & Technology, Prince Consort Road, London, S.W.7, by 8th July, 1960.

Railway Stock Market

Stock markets have lost further ground because of the continued fears of an increased credit squeeze or a rise in the Bank Rate. At the present time it is difficult to judge the effectiveness of the present credit squeeze, which appears to have affected some companies much more than others. In fact, official statistics indicated that the squeeze was not having any pronounced effect on h.p., bank loans, and retail trade. Rightly or wrongly the assumption in the City is that further action of some kind is likely from the Chancellor, and consequently markets have been reactionary.

Among foreign rails, Antofagasta rallied from 12½ a week ago to 15½, and the preference stock from 28½ to 33½; the 5 per cent (Bolivia) debentures were 108½ and the 4 per cent perpetual debentures 50.

Chilean Northern first debentures remained at 59½, while Costa Rica ordinary stock kept at 36½ and the first and second debentures were 90 and 110 respectively. Brazil Railway bonds were 6½. Guayaquil & Quito assented bonds changed hands at 71 and Paraguay Central prior debentures were 15½.

Sao Paulo Railway 3s. units remained at 1s. 3d., United of Havana second income stock at 6 and Mexican Central "A" bearer debentures came back from 59½ to 57½.

International of Central America eased from \$25 to \$24, but the preferred remained at \$112½.

Nyasaland Railways shares kept at 10s. and the 3½ per cent debentures were 48½. Midland of Western Australia was 6½, while the income stock strengthened further from 25½ a week ago to 27½ and the first debentures remained at 72½. Barsi ordinary stock, was quoted at 18, and West of India Portuguese capital stock at 111 with the 5 per cent debentures 93½.

Among locomotive builders, engineers, and kindred shares, G. D. Peters were quoted at 17s. 6d., while Beyer Peacock 5s. shares eased from 7s. 10½d. to 7s. 6d. and Charles Roberts 5s. shares came back from 12s. 9d. to 12s. at which there is a yield of over 6 per cent on the basis of last year's 15 per cent dividend. Westinghouse Brake at 49s. 9d. were virtually the same as a week ago, while Wagon Repairs 5s. shares have reacted from 13s. 3d. to 12s. 9d. but Gloucester Wagon rose further from 12s. 6d. to 13s. 9d. North British Locomotive were 9s. 3d. and Birmingham Carriage Wagon came back to 37s.

Reflecting the general trend of markets, Dowty Group 10s. shares reacted from 41s. 3d. to 37s. 6d. and Pressed Steel 5s. shares from 34s. 9d. to 31s. 10½d. A feature was activity and strength of Pollard Bearing 4s. shares which, compared with a week ago, moved up from 39s. 9d. to 41s. 3d. Ransome & Marles 5s. shares strengthened from 24s. to 24s. 9d.

Associated Electrical shares came back from 58s. to 55s. 3d. and General Electric from 39s. 9d. to 37s. 6d., while English Electric were 38s. 3d. compared with 41s. 6d. a week ago. Crompton Parkinson eased from 13s. 6d. to 13s. 1½d. x d. B.I. Cables at 51s. 9d. were the same as a week ago and Johnson & Phillips were maintained at 21s. 3d.

Vickers came back from 34s. 6d. to 34s., T. W. Ward from 72s. to 71s. and John Brown lost a few pence at 45s. 3d. while Stone-Platt came back to 53s. 6d. at which there is a yield of over 5½ per cent. Steel shares lost some ground, partly because buyers are tending to await terms of the expected big offer of shares by Richard Thomas & Baldwins, which may appear next month. Metal Industries were steady at 62s. 6d. and Broom & Wade 5s. shares were quoted at 21s. 3d.

